TWG850-4 - Residential Voice Gateway

User manual

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CAUTION
Disconnect power before servicing.

This device is intended for indoor operation only. Telephone jacks Line 1 and Line 2 must not be connected to outside wiring.

CAUTION
To ensure reliable operation and to prevent overheating, provide adequate ventilation for this modem and keep it away from heat sources. Do not locate near heat registers or other heat-producing equipment. Provide for free air flow around the Wireless Voice Gateway and its power supply.

This symbol means that your inoperative electronic appliance must be collected separately and not mixed with the household waste. The European Union has implemented a specific collection and recycling system for which producers are responsible.

This appliance has been designed and manufactured with high quality materials and components that can be recycled and reused. Electrical and electronic appliances are liable to contain parts that are necessary in order for the system to work properly but which can become a health and environmental hazard if they are not handled or disposed of in the proper way. Consequently, please do not throw out your inoperative appliance with the household waste.

If you are the owner of the appliance, you must deposit it at the appropriate local collection point or leave it with the vendor when buying a new appliance.

- If you are a professional user, please follow your supplier's instructions.

- If the appliance is rented to you or left in your care, please contact your service provider.

Help us protect the environment in which we live !

NORTH AMERICAN CABLE INSTALLER:

This reminder is provided to call your attention to Article 820-40 of the National Electrical Code (Section 54 of the Canadian Electrical Code, Part 1) which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

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Important Information

Euro-PacketCable and Euro-DOCSIS compliant

This product was designed according to Euro-PacketCable Specifications, Euro-DOCSIS Specifications and Data over Cable Service Interface Specifications.

Operating Information

Operating Temperature: 0˚ - 40˚ C (32˚ - 104˚ F)
Storage Temperature: -30˚ to 65˚ C

If you purchased this product at a retail outlet, please read the following:

Product Information

Keep your sales receipt to obtain warranty parts and service and for proof of purchase. Attach it here and record the serial and model numbers in case you need them. The numbers are located on the back of the product.

Model No. _____Serial No _____

Purchase Date: _____Dealer/Address/Phone: _____

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Chapter 1: Connections and Setup

Introduction

Wireless Voice Gateway Features

- Support Multiple Provisioning Mode
- 4x Standard RJ-45 connectors for 10/100BaseT Ethernet with auto-negotiation and MDIS functions
- USB Connector for USB interface
- Two RJ-11 Foreign Exchange Station (FXS) ports for IP telephony
- Support simultaneous voice and data communications
- Two simultaneous voice conversations in the different FXS ports with different CODEC: PCM A-law, PCM-law, G.723.1, G.729, G.729a, G.729e, G.728, G.726, BV16 and BV32
- Echo Cancellation
- Voice Active Detection (VAD)
- DTMF detection and generation
- Comfort Noise Generation (CNG)
- Support V.90 fax and modem services
- Transparent bridging for IP traffic
- RSA and 56 bit DES data encryption security
- SNMP network management support
- Remote operating firmware downloading
- Support Web pages and private DHCP server for status monitoring
- Clear LED display
- Plug and Play

What's on the CD-ROM

Insert the Wireless Voice Gateway CD-ROM into your CD-ROM drive to view troubleshooting tips, the internal diagnostics, and other valuable information.

Note: You might need to use the CD-ROM to install the USB driver if you are connecting via the USB port.

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CD-ROM Contents:

- Electronic copy of this user's guide in additional languages (PDF format)
- Adobe Acrobat Reader — application you can load to read PDF format, if you don't have it loaded already
- USB drivers — required if connecting by USB
- Links to Thomson web site

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Chapter 1: Connections and Setup

Computer Requirements

For the best possible performance from your Wireless Voice Gateway, your personal computer must meet the following minimum system requirements (note that the minimum requirements may vary by cable companies):

	IBM PC COMPATIBLE	**MACINTOSH****
CPU	Pentium preferred	PowerPC or higher
System RAM	16MB (32MB preferred)	24MB (32MB preferred)
Operating System	Windows* XP/Vista, Linux	Mac OS** 7.6.1 or higher
Sound Card	Required for audio on CD-ROM	N/A
Video	VGA or better (SVGA preferred)	VGA or better (SVGA built-in preferred)
CD-ROM Drive	Required	Required
Ethernet	10BaseT or 100BaseT An Ethernet card makes it possible for your computer to pass data to and from the internet. You must have an Ethernet card and software drivers installed in your computer. You will also need a standard Ethernet cable to connect the Ethernet card to your Wireless Voice Gateway.	10BaseT or 100BaseT
USB Port	USB (Windows XP /Vista only) The Universal Serial Bus is a high speed bus that enables your computer to communicate simultaneously with a variety of peripherals. However, if you have other peripherals that send and receive a lot of information, such as speakers, printers or scanners, we recommend using an Ethernet card to support this modem.	
Software	• A TCP/IP network protocol for each machine • Microsoft Internet Explorer 4.0 or later or Netscape Navigator 4.0 or later. (5.0 and 4.7 or later, respectively, are strongly recommended.)	

* Windows is a trademark of Microsoft Corporation.

** Macintosh and the Mac OS are trademarks of Apple Computer, Inc.

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Wall Mounting

Number of screws: 2 pieces.

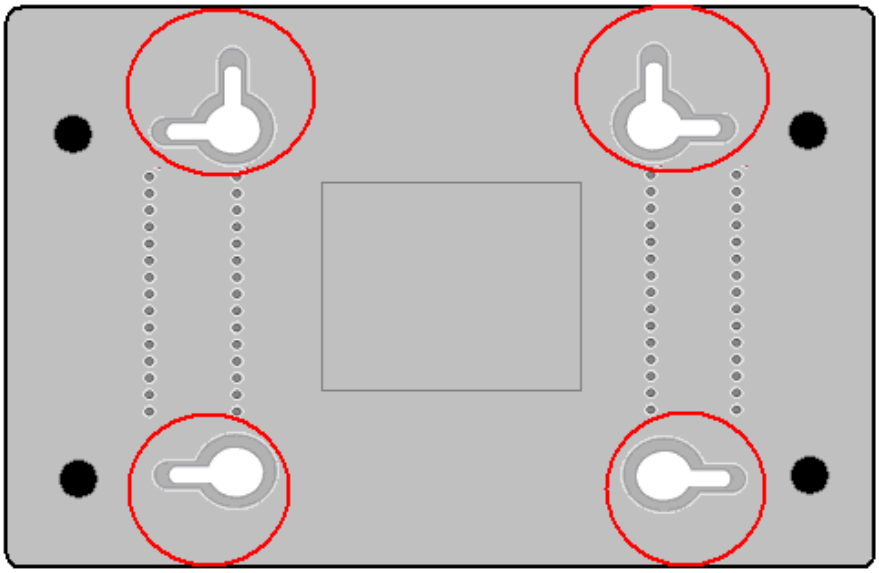
Direction for wall mounting: LED panel upward.

Dimension for the screw: 4.4 mm.

There are 4 slots on the underside of the gateway that can be used for wall mounting.

Note: When wall mounting the unit, ensure that it is within reach of the power outlet.

You will need 2 suitable screws which screw diameter would be 4.4 mm to wall mount the Cable Modem or the Battery Pack.



To do this:

1. Ensure that the wall you use is smooth, flat, dry and sturdy and use the 4 screw holes which are 101.6 mm apart from each other.
2. Fix the screws into wall, leaving their heads 3 mm (0.12 inch) clear of the wall surface.
3. Remove any connections to the unit and locate it over the screw heads. When in line, gently push the unit on to the wall and move it downwards to secure.

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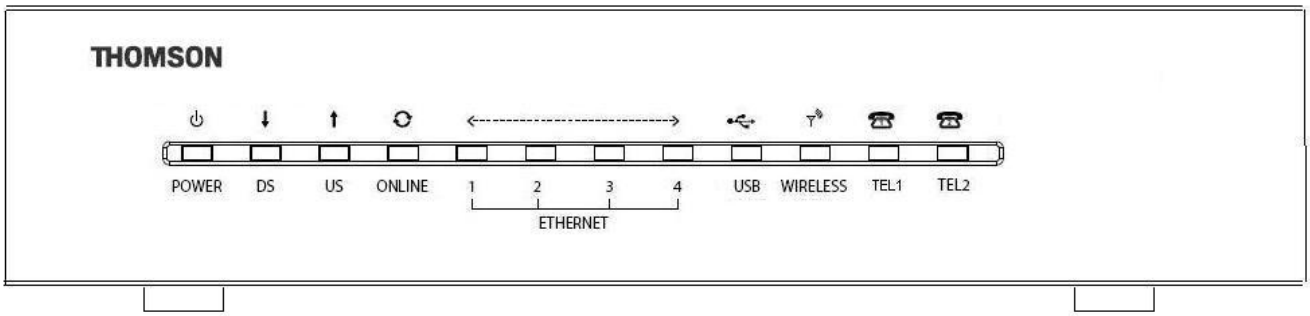
Chapter 1: Connections and Setup

Wireless Voice Gateway TWG850-4 Overview

Front Panel

The following illustration shows the front panel of the TWG850-4 gateway:



The LEDs on the front panel are described in the table below (from left to right):

	Power	Internet			Ethernet				USB	Wireless	Tel 1	Tel 2	Description
		DS	US	Online	1	2	3	4					
Boot-up Operation	ON	ON	ON	ON	ON	ON	ON	ON	ON	X	ON	ON	Power on 0.25 sec
	ON	0.25 second											
	ON	FLASH	FLASH	FLASH	X	X	X	X	X	X	X	X	From power ON to system initialization complete
	ON	ON	ON	ON	X	X	X	X	X	X	X	X	Following system initialization complete to (before) DS scanning
		1 second											
DOCSIS Start-up Operation	ON	FLASH	OFF	OFF	X	X	X	X	X	X	X	X	During DS scanning and acquiring SYNC
	ON	ON	FLASH	OFF	X	X	X	X	X	X	X	X	From SYNC completed, receiving UCD to ranging completed
	ON	ON	ON	FLASH	X	X	X	X	X	X	X	X	During DHCP, configuration file download, registration, and Baseline Privacy initialization: DHCP status: 1 second ON and 1 second OFF, TFTP status: 0.25 second ON and 0.25 second OFF
	ON	ON	ON	ON	X	X	X	X	X	X	X	X	Operational (NACO=ON)
	ON	FLASH	FLASH	OFF	X	X	X	X	X	X	X	X	Operational (NACO=OFF)
MTA	ON	ON	ON	ON	X	X	X	X	X	X	FLASH	OFF	MTA DHCP

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	ON	ON	ON	ON	X	X	X	X	X	X	OFF	FLASH	MTA SNMP/TFTP
	ON	ON	ON	ON	X	X	X	X	X	X	FLASH	FLASH	RSIP
CPE Operation	ON	X	X	X	OFF ON FLASH	OFF ON FLASH	OFF ON FLASH	OFF ON FLASH	X	X	X	X	No Ethernet Link Ethernet Link TX/RX Ethernet Traffic
	ON	X	X	X	X	X	X	X	OFF ON FLASH	X	X	X	No USB Link USB Link TX/RX USB Traffic
	ON	X	X	X	X	X	X	X	X	OFF ON FLASH	X	X	No Wireless Link Wireless Link TX/RX Wireless Traffic
MTA Operation	ON	<CM Normal Operation>									ON	ON	Both Lines On-Hook
	ON										FLASH	ON	Tel1 Off-hook, Tel2 On-hook
	ON										ON	FLASH	Tel1 On-hook, Tel2 Off-hook
	ON										FLASH	FLASH	Both Lines Off-Hook
SW Download Operation	ON	FLASH	FLASH	ON	X	X	X	X	X	X	X	X	A software download and while updating the FLASH memory

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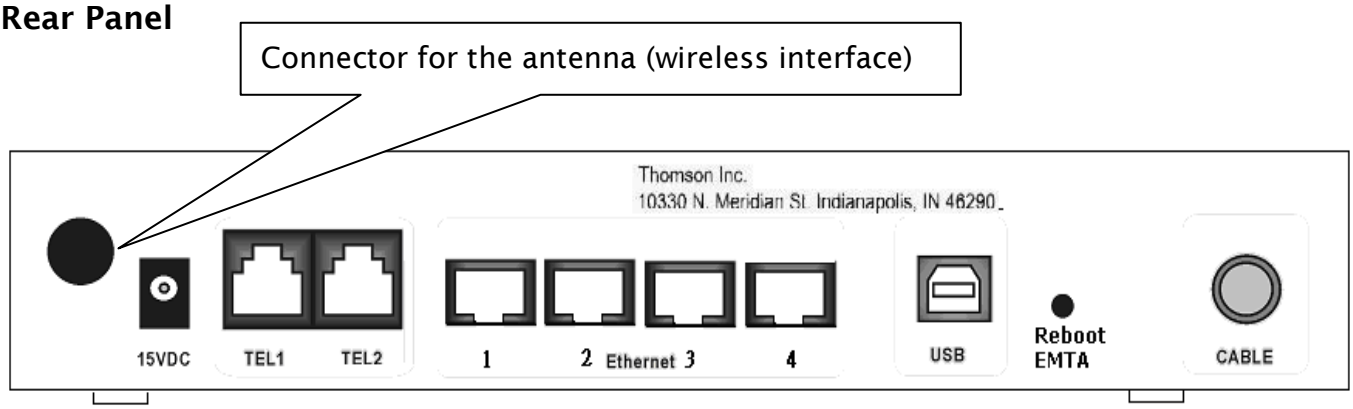
Chapter 1: Connections and Setup

Rear Panel



TEL1 & TEL2	Telephony RJ-11 connectors
ETHERNET:	4x Ethernet 10/100BaseT RJ-45 connectors
USB:	USB Connector
REBOOT EMTA:	Reboot this Wireless Voice Gateway
CABLE:	F-Connector
15VDC :	Power connector
Antenna connector:	Wireless interface

Flank Panel

- WPS: WiFi Protected Setup

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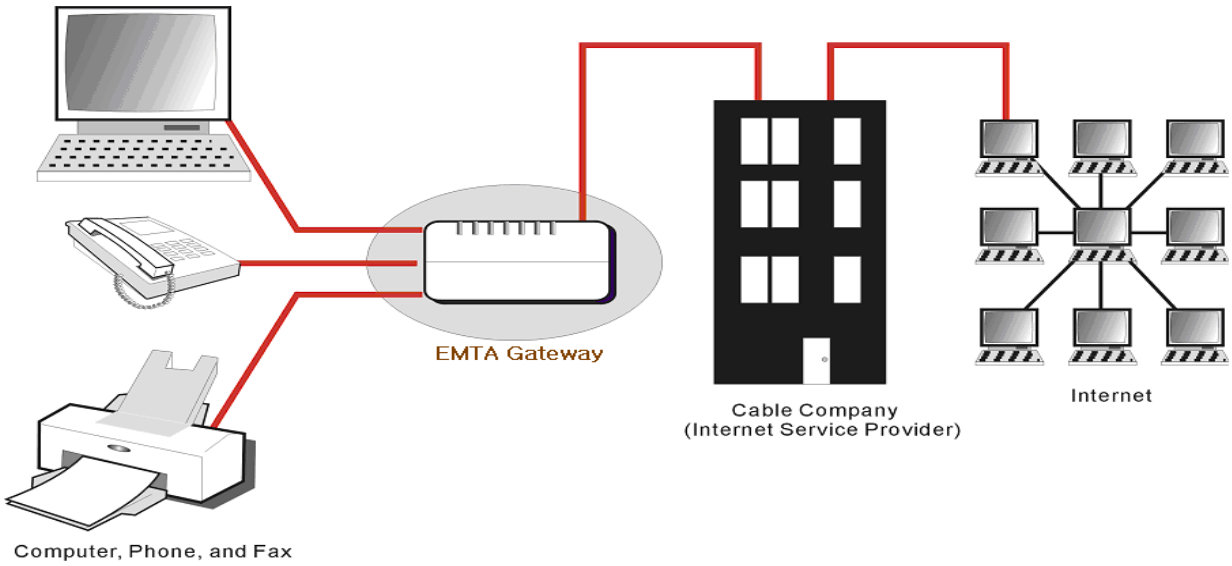
Relationship among the Devices

This illustration shows a cable company that offers Euro-DOCSIS- and Euro-PacketCable-compliant voice/data services.



What the Modem Does

The Wireless Voice Gateway provides high-speed Internet access as well as cost-effective, toll-quality telephone voice and fax/modem services over residential, commercial, and education subscribers on public and private networks via an existing CATV infrastructure. It can inter-operate with the Euro-PacketCable compliant headend equipment and provide the IP-based voice communications. The IP traffic can transfer between the Wireless Voice Gateway and Euro-DOCSIS compliant headend equipment. The data security secures upstream and downstream communications.

What the Modem Needs to Do Its Job

- **The Right Cable Company:** Make sure your local cable company provides data services that use cable TV industry-standard Euro-DOCSIS compliant and Euro-PacketCable compliant technology.

- **The Internet/Telephony Service Provider (ISP/TSP):** Your cable company provides you access to an Internet Service Provider (ISP) and Telephony Service Provider (TSP). The ISP is your gateway to the Internet and provides you with a pipeline to access Internet content on the World Wide Web (WWW). The TSP provides you with telephony access to other modems or other telephony services over the Public Switched Telephone Network (PSTN).

Check with your cable company to make sure you have everything you need to begin; they'll know if you need to install special software or re-configure your computer to make your cable internet service work for you.

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Chapter 1: Connections and Setup

Contact Your Local Cable Company

You will need to contact your cable company to establish an Internet account before you can use your gateway. You should have the following information ready (which you will find on the sticker on the gateway):

- The serial number
- The model number
- The Cable Modem (CM) Media Access Control (MAC) address
- The Terminal Adapter (EMTA) MAC address
- SSID, WPA2-PSK information

Please verify the following with the cable company

- The cable service to your home supports Euro-DOCSIS compliant two-way modem access.
- Your internet account has been set up. (The Media Terminal Adapter will provide data service if the cable account is set up but no telephony service is available.)
- You have a cable outlet near your PC and it is ready for Cable Modem service.

Note: It is important to supply power to the modem at all times. Keeping your modem plugged in will keep it connected to the Internet. This means that it will always be ready whenever you need.

Important Information

Your cable company should always be consulted before installing a new cable outlet. Do not attempt any rewiring without contacting your cable company first.

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Connecting the Wireless Voice Gateway to a Single Computer

This section of the manual explains how to connect your Wireless Voice Gateway to the USB or Ethernet port on your computer and install the necessary software. Please refer to Figure 1 to help you connect your Digital Cable Modem for the best possible connection.

Attaching the Cable TV Wire to the Wireless Voice Gateway

1. Locate the Cable TV wire. You may find it one of three ways:

    a. Connected directly to a TV, a Cable TV converter box, or VCR. The line will be connected to the jack which should be labeled either IN, CABLE IN, CATV, CATV IN, etc.

    b. Connected to a wall-mounted cable outlet.

    c. Coming out from under a baseboard heater or other location. See Figure 1 for the wiring example.

Notes: For optimum performance, be sure to connect your Wireless Voice Gateway to the first point the cable enters your home. The splitter must be rated for at least 1GHz.

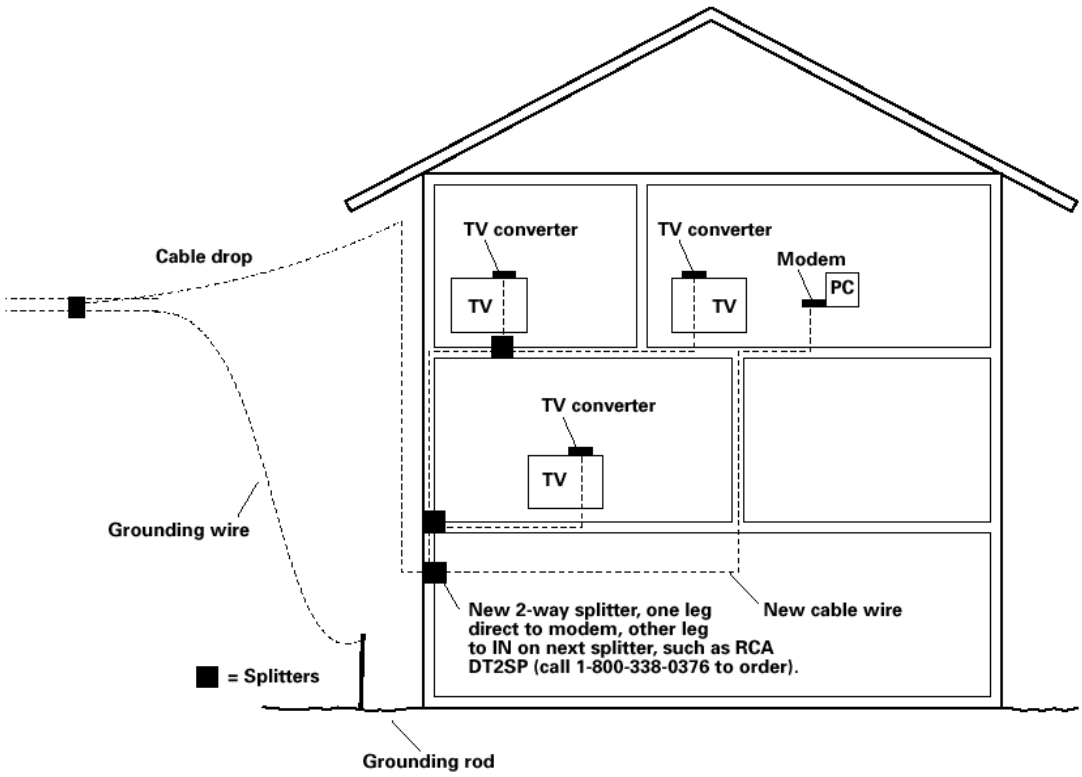

Fig. 1: Basic Home Wiring

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Chapter 1: Connections and Setup

Important Connection Information

The Wireless Voice Gateway supports Ethernet and USB connections simultaneously. Below are important points to remember before you connect the Wireless Voice Gateway.

- For USB connection, follow the instructions on this page 11.
- For Ethernet connections, go to page 19.
- For telephone and fax connections, go to page 21.

USB Connection to One Computer

Note: Only use the power supply provided with this unit. Using other power supplies may damage the unit.

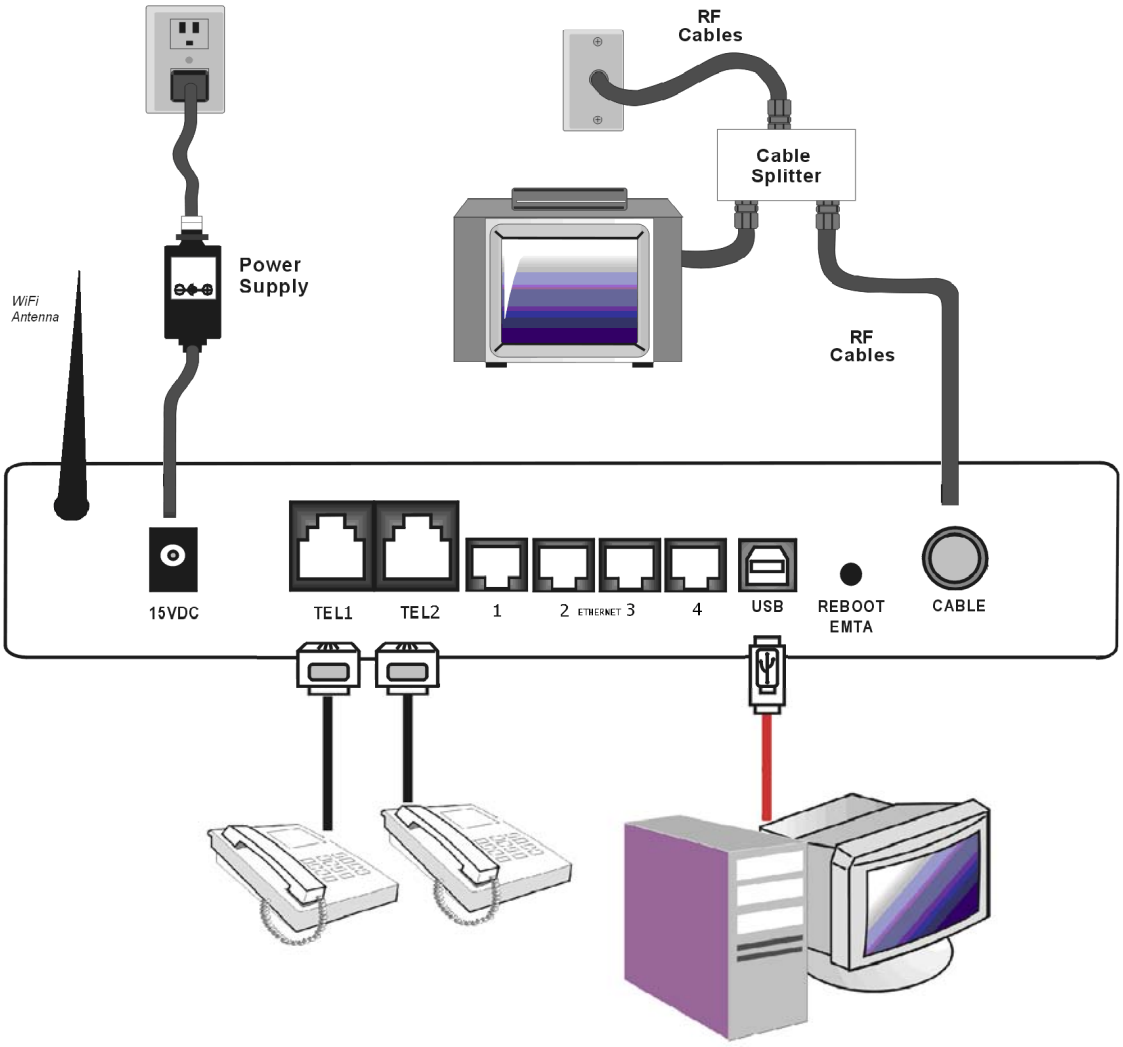

Fig. 2: USB Connection

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If you received an Installation/Quick Start kit with the purchase of your modem, you should use the software provided in that kit. If not, the Wireless Voice Gateway CD included with your modem contains the drivers and other information you need to install your Wireless Voice Gateway.

USB Connection

If you do not want to use the CD-ROM, follow instructions 1 through 5 to connect the Wireless Voice Gateway to the USB port on your computer. **Instructions must be followed in the order they appear.**

1. Connect one end of the coaxial cable to the cable connection on the wall, and the other end to the CABLE jack on the Wireless Voice Gateway.

2. Connect the plug from the AC power supply into the POWER AC ADAPTER jack on the Wireless Voice Gateway and plug the power supply into an AC outlet.

3. Insert the supplied Wireless Voice Gateway CD-ROM. Wait momentarily for the CD window display.

Fig. 3

4. Close **all** open applications and dialog boxes, including the CD window.

Note: Some applications may interfere with your Wireless Voice Gateway installation.

5. Connect one end of the USB cable to the USB port located on the back of your computer. Connect the other end of the USB cable to the USB port on the Wireless Voice Gateway.

Note: Use only the power supply that accompanied this unit. Using other power supplies may damage the unit.

Next, you need to install the USB driver for your operating system.

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Using Windows XP for USB Connection

Follow steps 6 through 9 if you have a Windows XP operating system:

6. Windows XP will display the "Welcome to the Found New Hardware Wizard" window, and ask whether you would like the Windows to connect to Windows Update to search for software, Choose "No, not this time" and click "Next".

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Fig. 4

7. The "Found New Hardware Wizard" will then display the device name and ask you to insert the installation CD-ROM that came with the unit. Choose the "Install from a list or specific location (Advanced)" option, and click "Next."

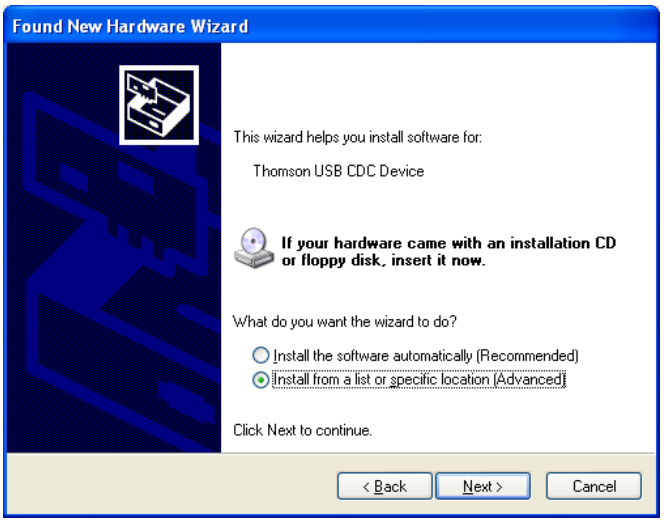
Found New Hardware Wizard
This wizard helps you install software for:
Thomson USB CDC Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Fig. 5

Note: If Windows XP does not recognize the presence of the Wireless Voice Gateway, i.e., the "Welcome to the New Hardware Wizard" did not automatically appear, your BIOS settings may not permit USB and/or Plug-and-Play devices. Please contact the customer service department of the computer company.

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8. Select “Search Removable Media (floppy, CD-ROM…)” and click on “Next”, then your computer will install the drivers for the “Thomson Digital Cable Modem”.

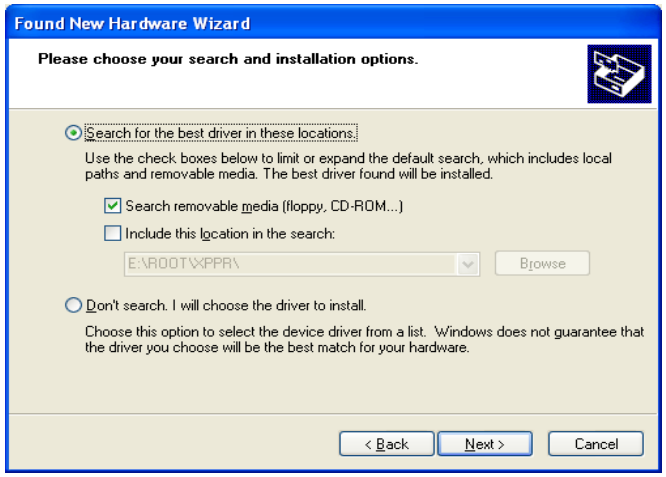
Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
E:\ROOT\XPPR\
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Fig. 6

9. When the “Completing the Found New Hardware Wizard” window appears, click “Finish” to complete the process.

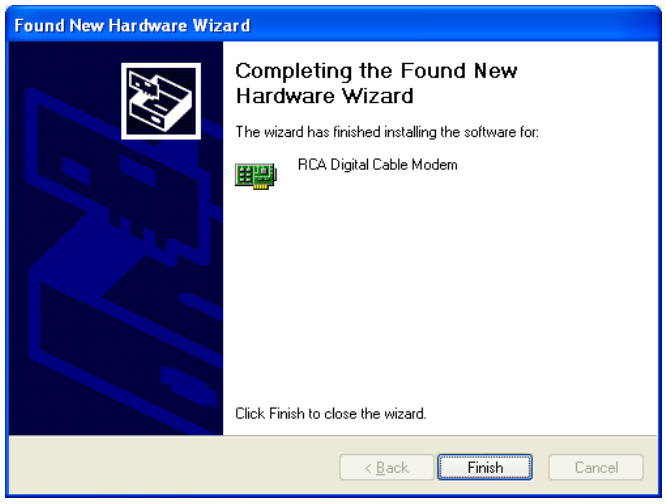
Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
RCA Digital Cable Modem
Click Finish to close the wizard.
< Back
Finish
Cancel

Fig. 7

10. The Wireless Voice Gateway installation is now complete. To validate a proper installation, perform the following instructions:

    A. Click on the “Start” icon in the lower left-hand corner of your screen.

    B. Select “Settings,” followed by “Control Panel.” The “Control Panel” window will appear.

    C. Double-click on the “System” icon, and select the “Device Manager.”

    D. Scroll down the list until you come to “Network Adapters.” Double-click on “Network Adapters.”

    E. The “Thomson Digital Cable Modem” should exist. If “Thomson or RCA Digital Cable Modem” does not exist, the Wireless Voice Gateway was **NOT** installed correctly.

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Chapter 1: Connections and Setup

Using Windows Vista for USB Connection

Follow steps 6 through 11 if you have a Windows Vista operating system:

6. Windows Vista will briefly display the "Windows need to install driver software for your Thomson USB CDC Device." Choose the "Locate and install driver software (recommended)."option

   Note: If Windows Vista does not recognize the cable modem's presence, i.e., the "Windows need to install driver software for your Thomson USB CDC Device." did not automatically appear, your BIOS settings may not permit USB and/or Plug-and-Play devices. Please contact your computer's customer service department.

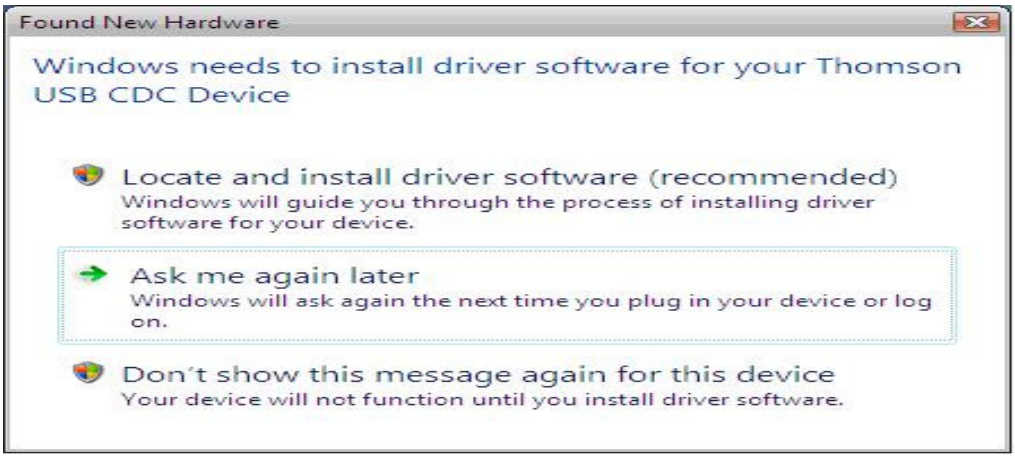
Found New Hardware
Windows needs to install driver software for your Thomson USB CDC Device
Locate and install driver software (recommended)
Windows will guide you through the process of installing driver software for your device.
Ask me again later
Windows will ask again the next time you plug in your device or log on.
Don't show this message again for this device
Your device will not function until you install driver software.

Fig. 8

7. Windows will appear "Windows need your permission to continue" and click "continue"

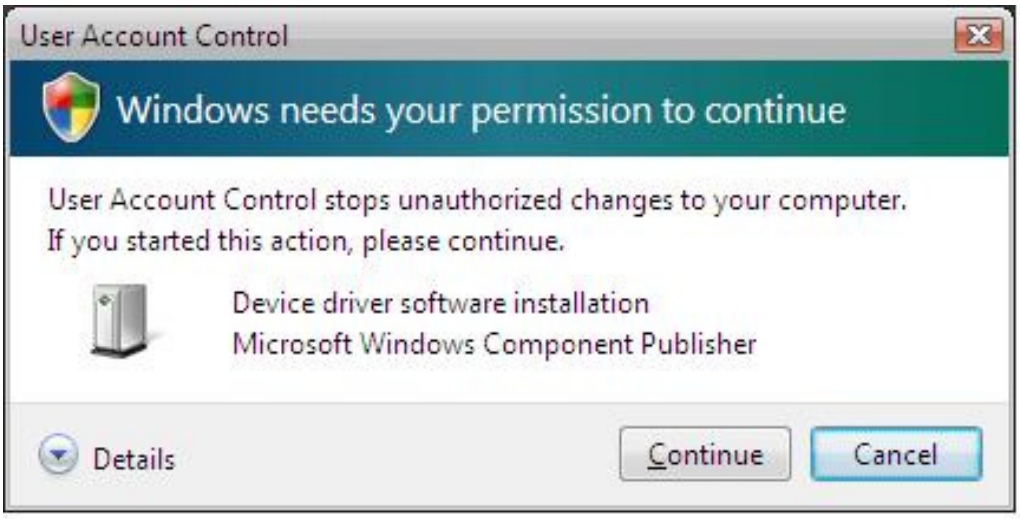
User Account Control
Windows needs your permission to continue
User Account Control stops unauthorized changes to your computer.
If you started this action, please continue.
Device driver software installation
Microsoft Windows Component Publisher
Details
Continue
Cancel

Fig. 9

Illustrations contained in this document are for representation only.

8. When appears ”Allow Windows to search online for driver software for your Thomson USB CDC Device?” Choose the “Don’t search online” option to continue.

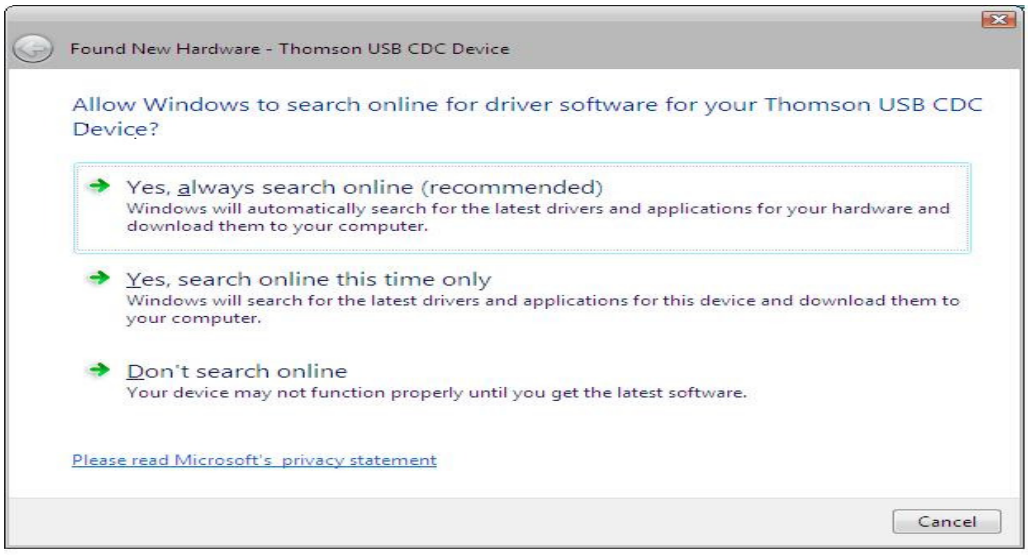
Found New Hardware - Thomson USB CDC Device
Allow Windows to search online for driver software for your Thomson USB CDC Device?
Yes, always search online (recommended)
Windows will automatically search for the latest drivers and applications for your hardware and download them to your computer.
Yes, search online this time only
Windows will search for the latest drivers and applications for this device and download them to your computer.
Don't search online
Your device may not function properly until you get the latest software.
Please read Microsoft's privacy statement
Cancel

Fig. 10

9. Your computer will ask you to insert the installation CD-ROM that came with the unit and click “Next” to continue. (Fig.11)

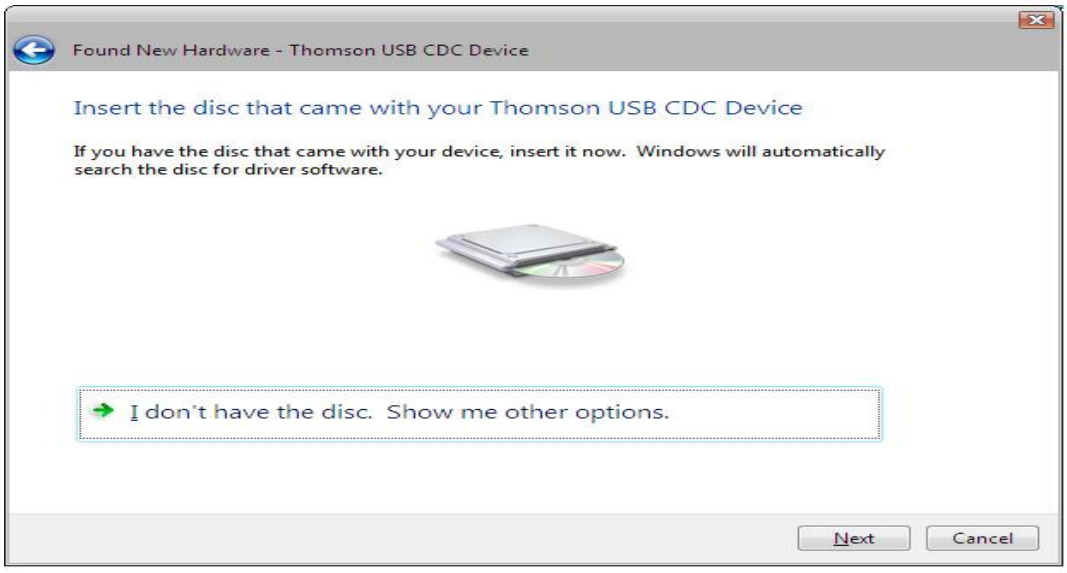
Found New Hardware - Thomson USB CDC Device
Insert the disc that came with your Thomson USB CDC Device
If you have the disc that came with your device, insert it now. Windows will automatically search the disc for driver software.
I don't have the disc. Show me other options.
Next
Cancel

Fig. 11

.

Illustrations contained in this document are for representation only.

10. Your computer will install the drivers for the “Thomson USB Cable Modem”

    Click on “Close” to complete the process.

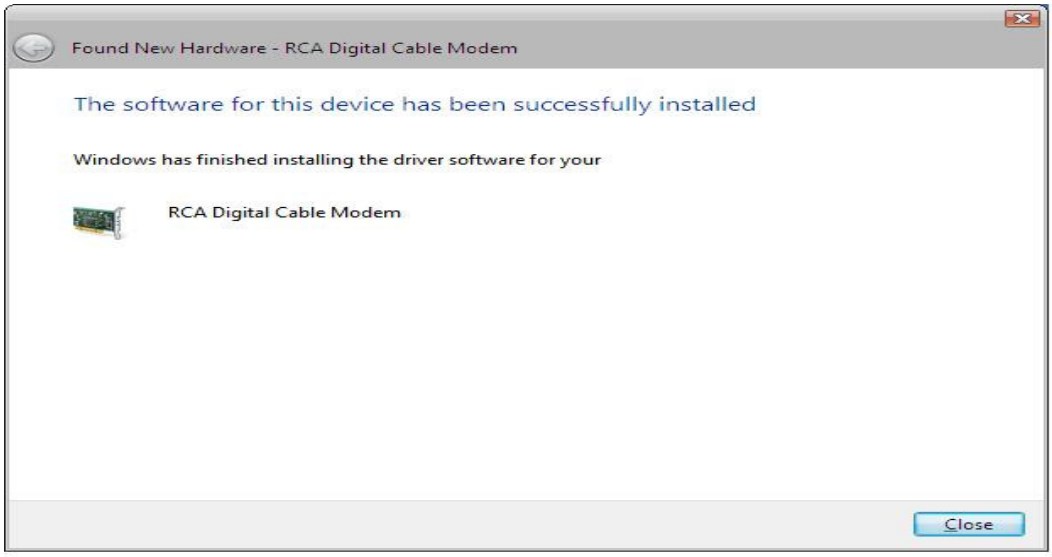
Found New Hardware - RCA Digital Cable Modem
The software for this device has been successfully installed
Windows has finished installing the driver software for your
RCA Digital Cable Modem
Close

Fig. 12

11. Choose a network category and click “OK”.

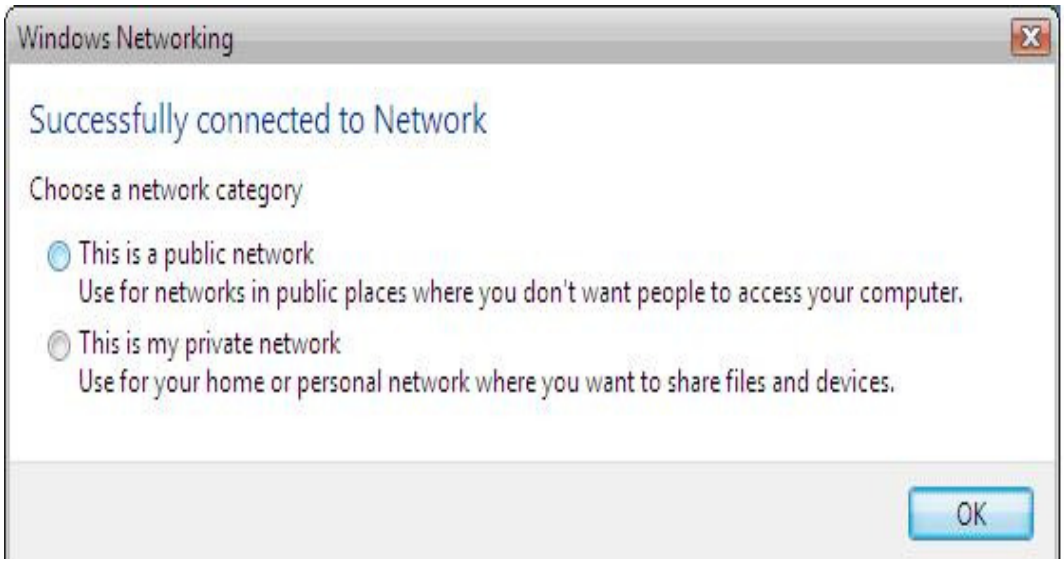
Windows Networking
Successfully connected to Network
Choose a network category
This is a public network
Use for networks in public places where you don't want people to access your computer.
This is my private network
Use for your home or personal network where you want to share files and devices.
OK

Fig. 13

Illustrations contained in this document are for representation only.

12.The cable modem installation is now completed.

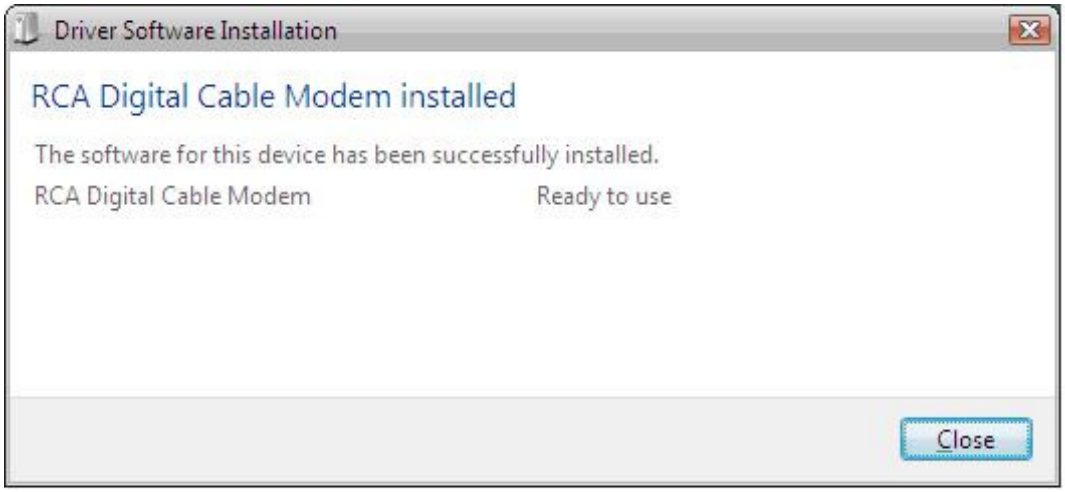
Driver Software Installation
RCA Digital Cable Modem installed
The software for this device has been successfully installed.
RCA Digital Cable Modem
Ready to use
Close

Fig. 14

To validate a proper installation, perform the following instructions:

•Click on the “Start” icon in the lower left-hand corner of your screen.

•Select “Settings,” followed by “Control Panel.” The “Control Panel” window will appear.

• Double-click on the “network center” icon, and select the “Manage network connections.”

• The “Thomson USB Cable Modem” should exist. If “Thomson or RCA USB Cable Modem” does not exist, the cable modem was **NOT** installed correctly.

Illustrations contained in this document are for representation only.

Chapter 1: Connections and Setup

Ethernet Connection to a Computer

Make the connection to the modem in the following sequence:

1. Connect one end of the coaxial cable to the cable connection on the wall, and the other end to the CABLE jack on the Wireless Voice Gateway.

2. Connect the plug from the AC power supply into the POWER AC ADAPTER jack on the Wireless Voice Gateway, and plug the power supply into an AC outlet.

Note: Use only the power supply that accompanied this unit. Using other adapters may damage the unit.

3. Connect one end of the Ethernet cable (straight-wired, see below) to the Ethernet port on the back of your computer, and the other end to the ETHERNET port on the Wireless Voice Gateway.

   Make sure that the Ethernet cable is straight-wired (not "null" or crossover-wired). However, you will need a crossover-type cable if you are connecting the modem to a hub, or a hub within a port switch that provides the same function.

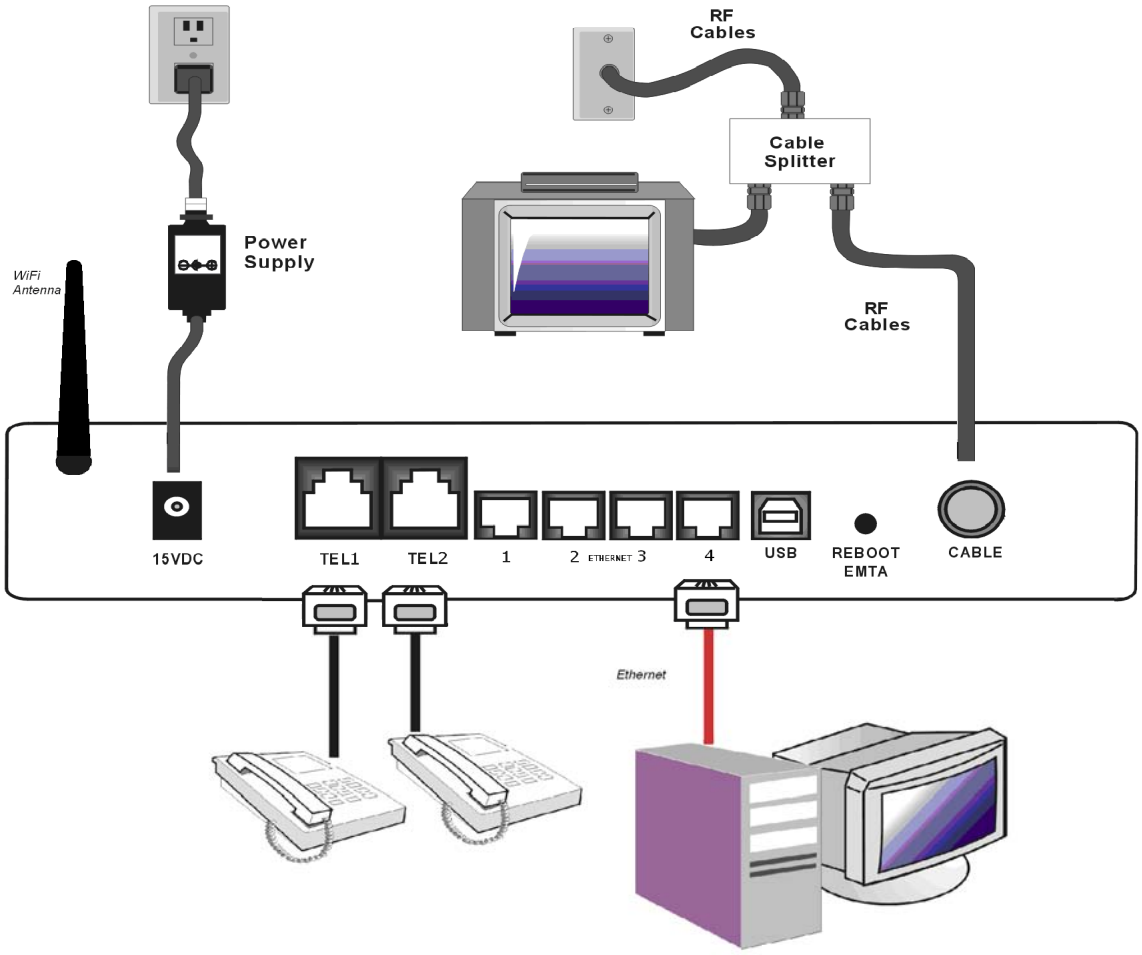

Fig. 15: Ethernet Connection

Illustrations contained in this document are for representation only.

Connecting More Than A Computer to the Wireless Voice Gateway

If you need to connect more than a computer to TWG850-4, simply connect the computers to the Ethernet ports on the rear panel.

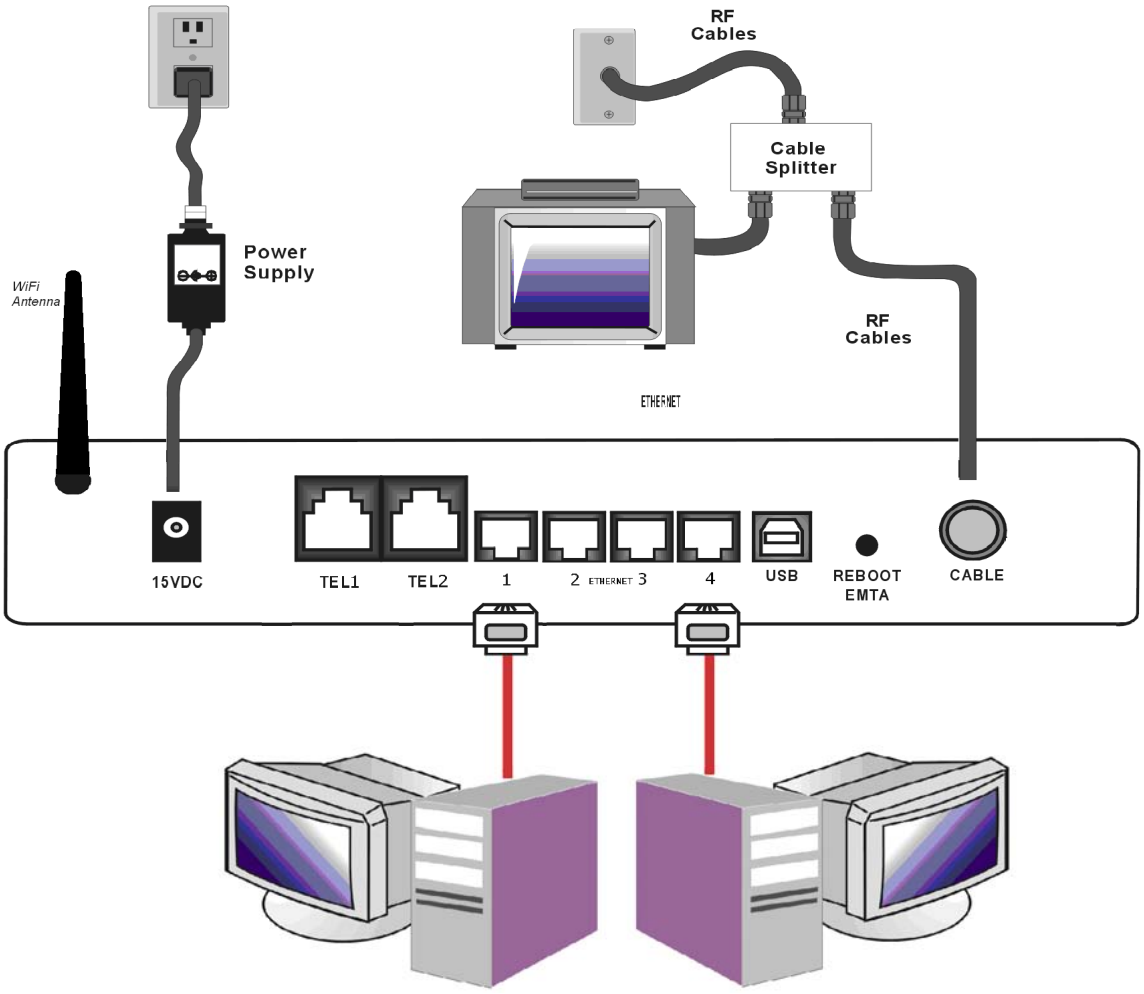

Fig. 16: Multiple-PC Connection

Note: You may need to check with your service provider in order to connect multiple computers.

Illustrations contained in this document are for representation only.

Chapter 1: Connections and Setup

Telephone or Fax Connection

When properly connected, most telephony devices can be used with the Wireless Voice Gateway just as with conventional telephone service. To make a normal telephone call, pick up the handset; listen for a dial tone, then dial the desired number. For services such as call waiting, use the hook switch (or FLASH button) to change calls. The following procedures describe some of the possible connection schemes for using telephony devices with the Wireless Voice Gateway.

1. Connect a standard phone line cord directly from the phone (fax machine, answering machine, caller ID box, etc.) to one of the LINE jacks on the Wireless Voice Gateway.

2. If there is a phone line in your home which is NOT connected to another telephone service provider, connect a standard phone line cord from a jack on this line to one of the LINE jacks of the Wireless Voice Gateway. Connect a standard phone line cord directly from the phone (fax machine, answering machine, caller ID box, etc.) to one of the other jacks in the house that uses that line.

3. If you have a multi-line telephone, connect a standard phone line cord (not an RJ-14 type line cord) from the phone to the LINE jacks on the Wireless Voice Gateway. (Other phones can be added to each line by using standard phone line splitters.

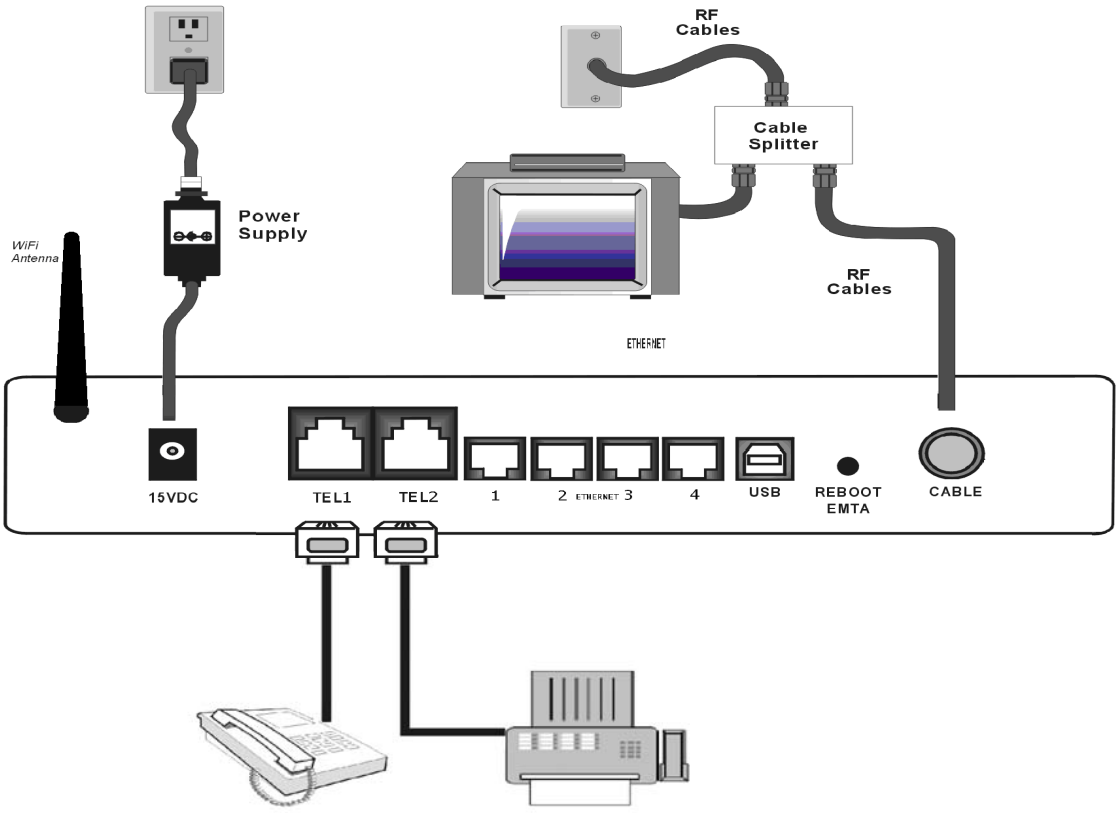

Fig. 17: Phone/Fax Connection

Illustrations contained in this document are for representation only.

Turning on the Wireless Voice Gateway

After installing the Wireless Voice Gateway and turn it on for the first time (and each time the modem is reconnected to the power), it goes through several steps before it can be used. Each of these steps is represented by a different pattern of flashing lights on the front of the modem.

Note: All indicators flash once before the initialization sequence.

If all of the lights are flashing sequentially, it means the Wireless Voice Gateway is automatically updating its system software. Please wait for the lights to stop flashing. You cannot use your modem during this time. Do not remove the power supply or reset the Wireless Voice Gateway during this process.

Chapter 2: WEB Configuration

To make sure that you can access the Internet successfully, please check the following first.

1. Make sure the connection (through Ethernet or USB) between the Wireless Voice Gateway and your computer is OK.
2. Make sure the TCP/IP protocol is set properly.
3. Subscribe to a Cable Company.

Accessing the Web Configuration

The **Wireless Voice Gateway** offers local management capability through a built in HTTP server and a number of diagnostic and configuration web pages. You can configure the settings on the web page and apply them to the device.

Once your host PC is properly configured; please proceed as follows:

1. Start your web browser and type the private IP address of the Wireless Voice Gateway on the URL field: **192.168.0.1.**
2. After connecting to the device, you will be prompted to enter username and password. By default, the username is " " and the password is "**admin**".

Fig. 18

If you login successfully, the main page will appear.

Illustrations contained in this document are for representation only.

Chapter 2: WEB Configuration

Outline of Web Manager

The main screen will be shown as below.

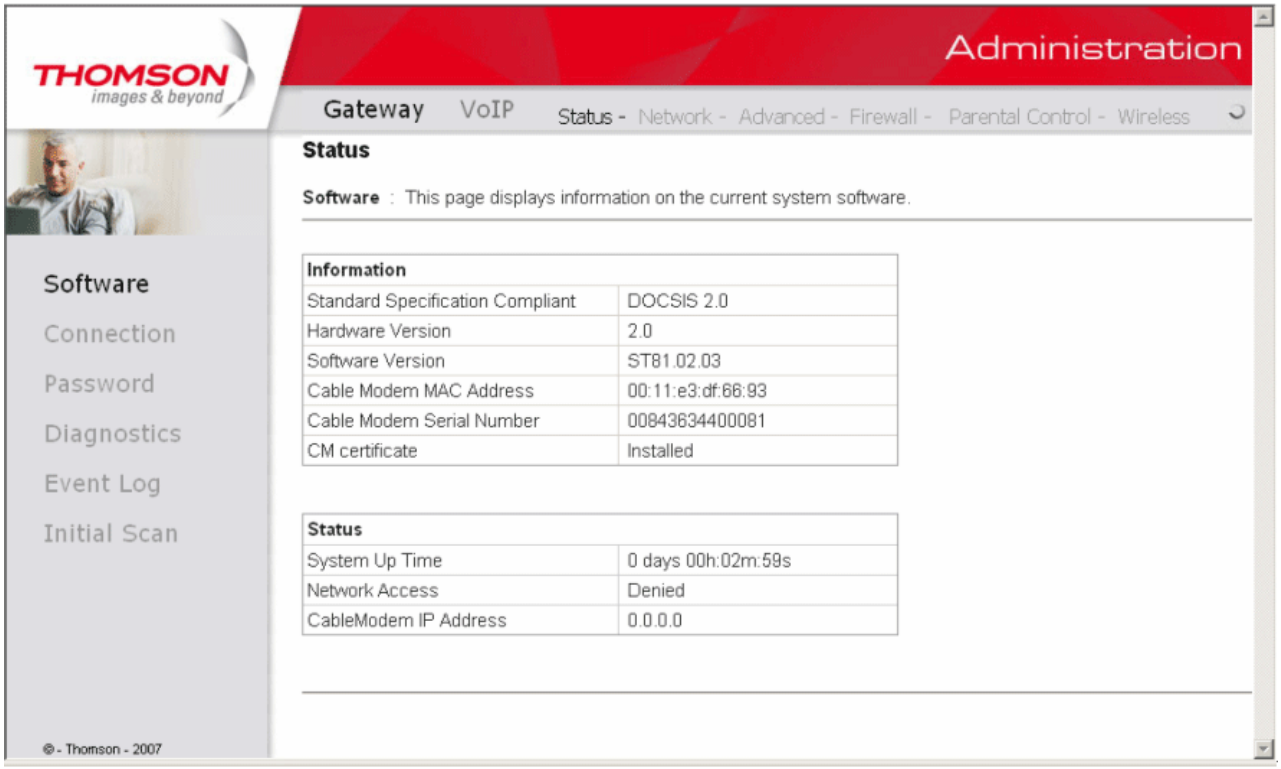

Fig. 19

- **Main Menu**: the hyperlinks on the top of the page, including Gateway, VoIP and several sub-menu items
- **Title**: the sidebar on the left side of the page indicates the title of this management interface, e.g., Software in this example
- **Main Window**: the current workspace of the web management, containing configuration or status information

For easy navigation, the pages are organized in groups, with group names main menu, individual page names within each group are provided in the sidebar. To navigate to a page, click the group hyperlink at the top, then the page title on the sidebar.

Your cable company may not support the reporting of some items of information listed on your gateway's internal web pages. In such cases, the information field appears blank. This is normal.

Illustrations contained in this document are for representation only.

Gateway – Status Web Page Group

1. Software

The information section shows the hardware and software information about your gateway.

The status section of this page shows how long your gateway has operated since last time being powered up, and some key information the Cable Modem received during the initialization process with your cable company. If Network Access shows "Allowed," then your cable company has configured your gateway to have Internet connectivity. If not, you may not have Internet access, and should contact your cable company to resolve this.

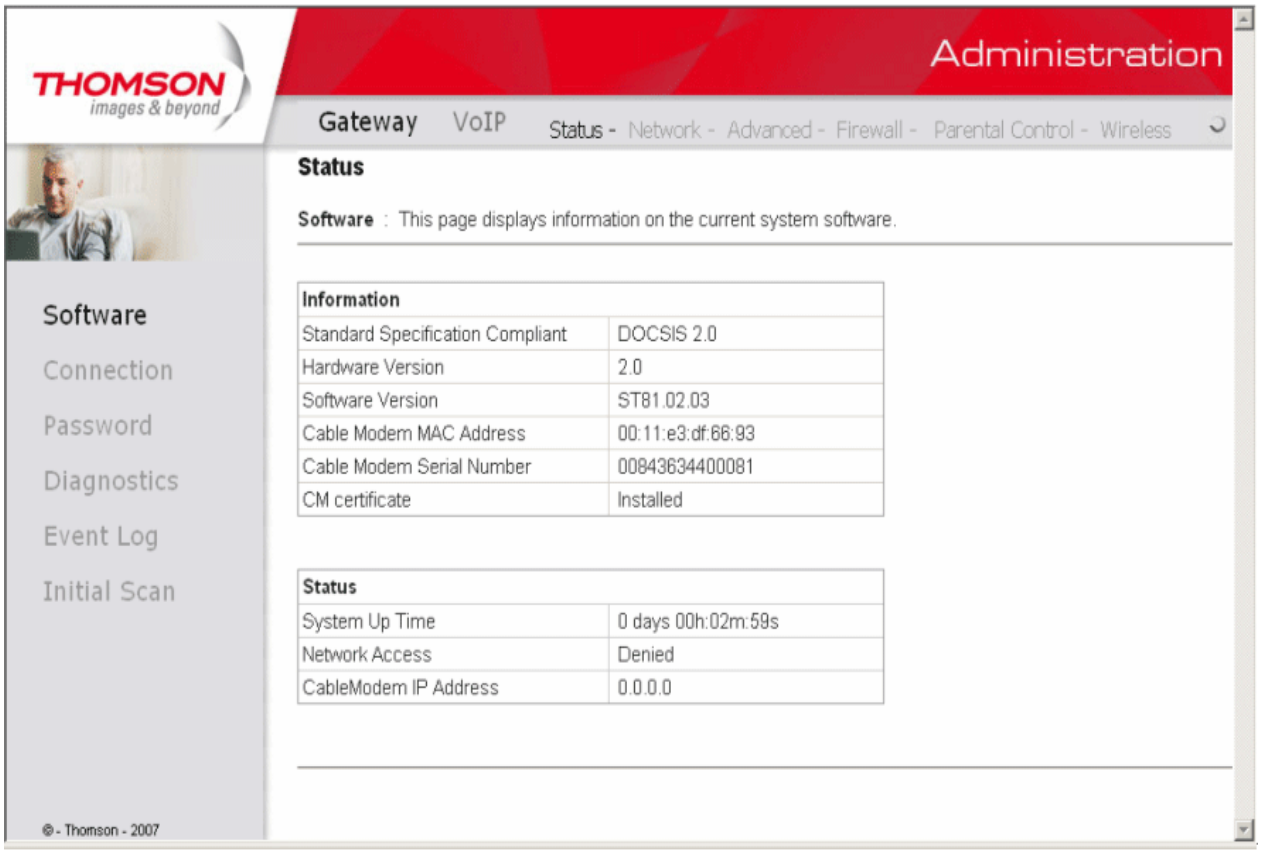

Fig. 20

Illustrations contained in this document are for representation only.

Chapter 2: WEB Configuration

2. Connection

This page reports current connection status containing startup procedures, downstream and upstream status, CM online information, and so on. The information can be useful to your cable company's support technician if you're having problems.

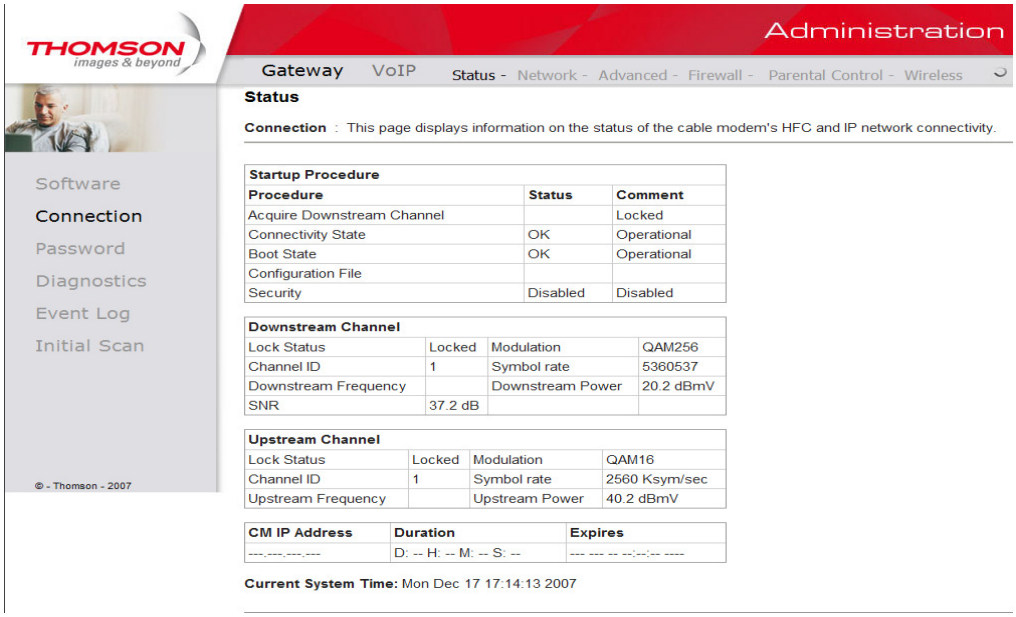
THOMSON
images & beyond
Administration
Gateway VoIP Status - Network - Advanced - Firewall - Parental Control - Wireless
Status
Connection : This page displays information on the status of the cable modem's HFC and IP network connectivity.
Software
Connection
Password
Diagnostics
Event Log
Initial Scan
© - Thomson - 2007
Startup Procedure
Procedure | Status | Comment
Acquire Downstream Channel | | Locked
Connectivity State | OK | Operational
Boot State | OK | Operational
Configuration File | |
Security | Disabled | Disabled
Downstream Channel
Lock Status | Locked | Modulation | QAM256
Channel ID | 1 | Symbol rate | 5360537
Downstream Frequency | | Downstream Power | 20.2 dBmV
SNR | 37.2 dB |
Upstream Channel
Lock Status | Locked | Modulation | QAM16
Channel ID | 1 | Symbol rate | 2560 Ksym/sec
Upstream Frequency | | Upstream Power | 40.2 dBmV
CM IP Address | Duration | Expires
---.---.---.--- | D: -- H: -- M: -- S: -- | --- --- -- --:--:-- ----
Current System Time: Mon Dec 17 17:14:13 2007

Fig. 21

3. Password

This page is used to change the password that enables you to access the gateway web pages next time. The default User ID is *" "(EMPTY)*, and the password is "*admin*". The password can be a maximum of 8 characters and is case sensitive. In addition, this page can be used to restore the gateway to its original factory settings. Use this with caution, as all the settings you have made will be lost. To perform this reset, set **Restore Factory Defaults** to **Yes** and click **Apply**. This has the same effect as a factory reset using the rear panel reset switch, where you hold on the switch for 15 seconds, then release it.

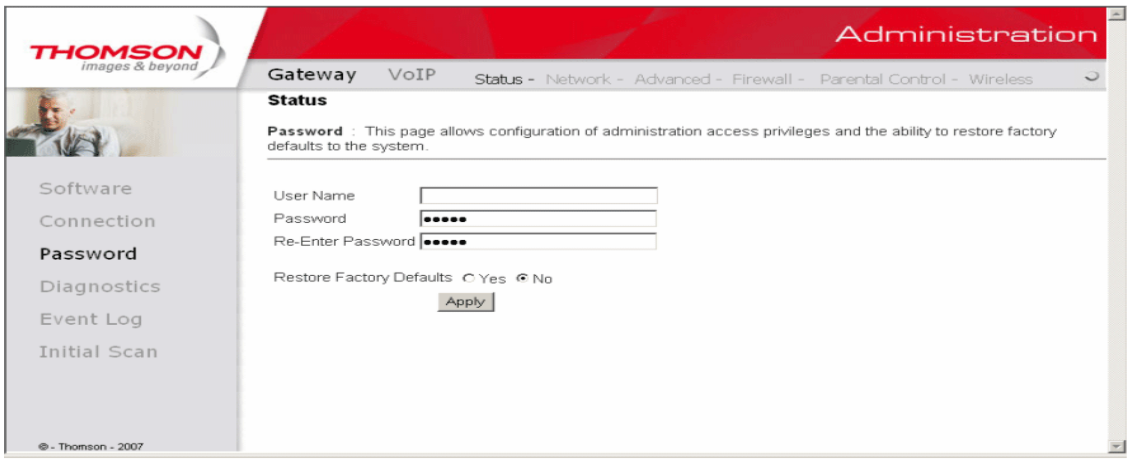

Fig. 22

Illustrations contained in this document are for representation only.

4. Diagnostics

This page offers basic diagnostic tools for you to utilize when connectivity problems occur. When you ping an Internet device, you send a packet to its TCP/IP stack, and it sends one back to yours. To use the ping Test, enter the information needed and press **Start Test**; the Result will be displayed in the lower part of the window. Press **Abort Test** to stop, and **Clear Results** to clear the result contents.

Note: Firewalls may cause pings to fail but still provide you TCP/IP access to selected devices behind them. Keep this in mind when pinging a device that may be behind a firewall. Ping is most useful to verify connectivity with PCs have no firewall, such as the PCs on your LAN side.

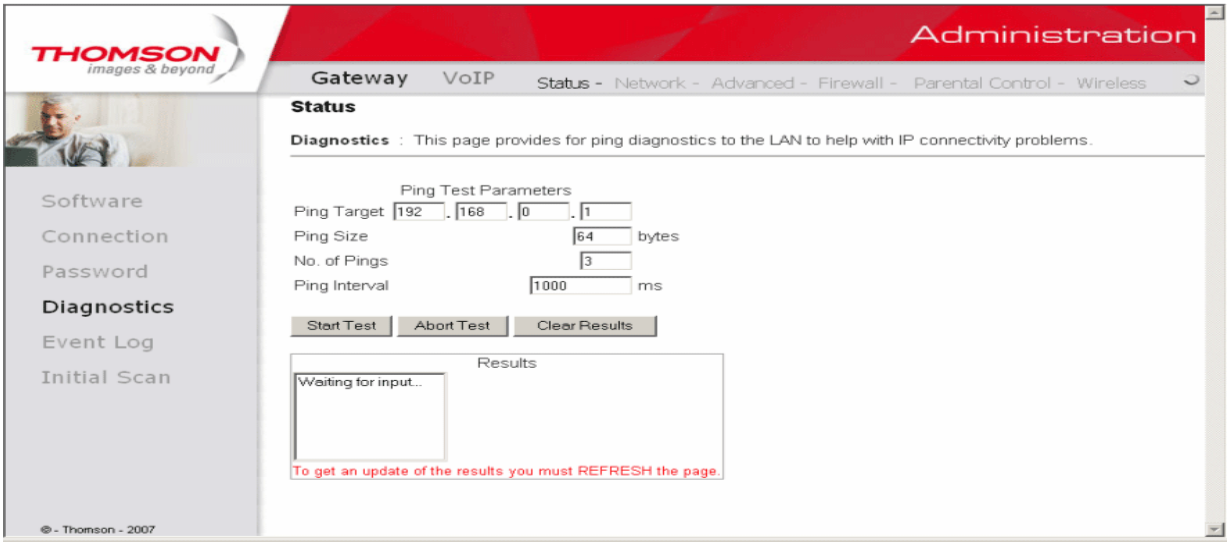

Fig. 23

5. Event Log

This page displays the contents of the SNMP event log. Press "**Clear Log**" button to clear the logs.

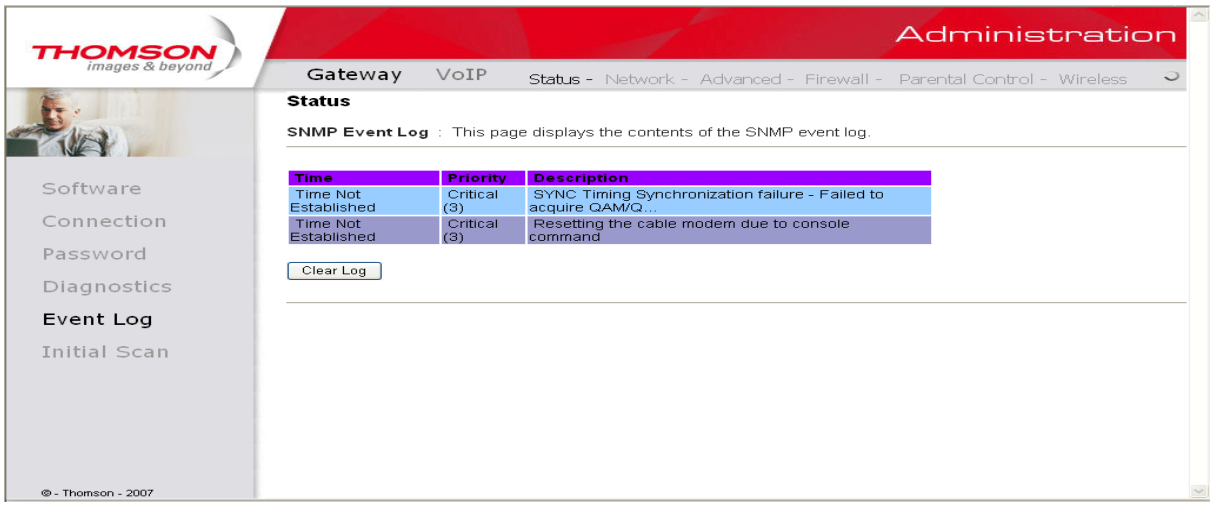

Fig. 24

Illustrations contained in this document are for representation only.

Chapter 2: WEB Configuration

6. Initial Scan

To speed up the modem's first time startup, enter known downstream frequency and/or upstream channel ID information here. Then click "**Apply and Reboot**" button to start scanning the cable network beginning with the values supplied here.

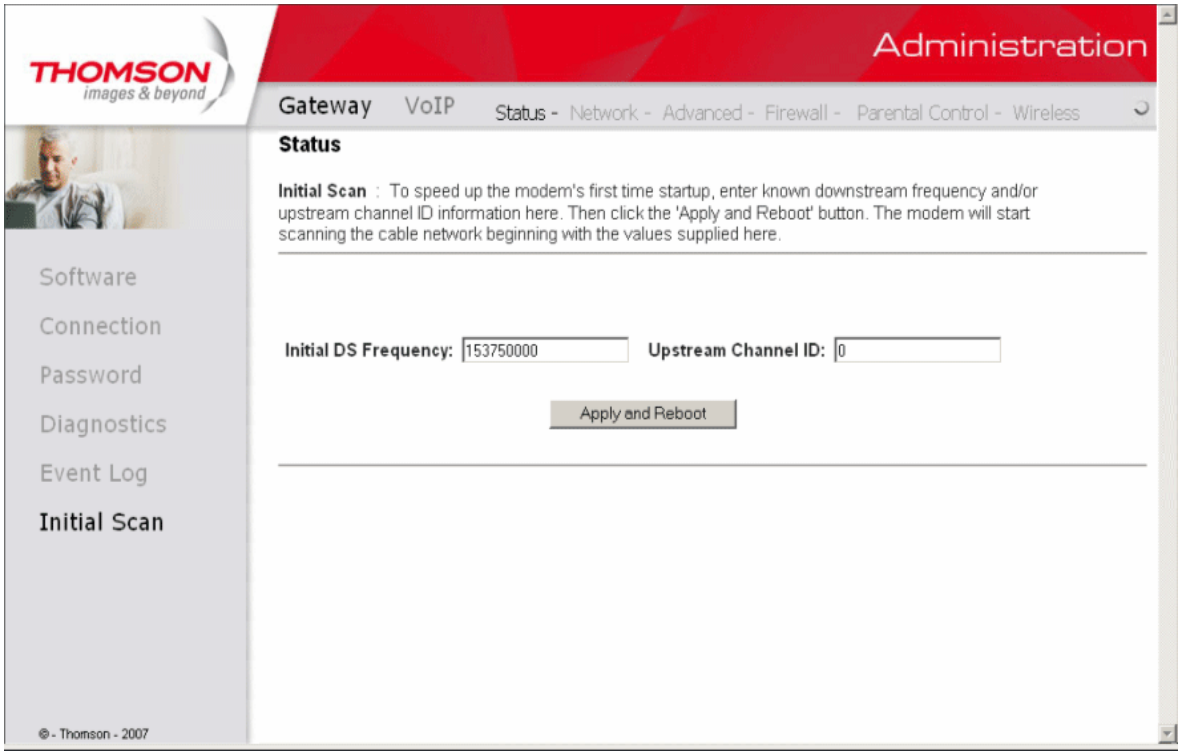
THOMSON
images & beyond
Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Status
Initial Scan : To speed up the modem's first time startup, enter known downstream frequency and/or upstream channel ID information here. Then click the 'Apply and Reboot' button. The modem will start scanning the cable network beginning with the values supplied here.
Software
Connection
Password
Diagnostics
Event Log
Initial Scan
Initial DS Frequency: 153750000
Upstream Channel ID: 0
Apply and Reboot
© - Thomson - 2007

Fig. 25

Illustrations contained in this document are for representation only.

Gateway – Network Web Page Group

1. LAN

You can activate the DHCP server function for the LAN on this page.

With this function activated, your cable company's DHCP server provides one IP address for your gateway, and your gateway's DHCP server provides IP addresses, starting at the address you set in IP Address on the LAN page, to your PCs. A DHCP server leases an IP address with an expiration time.

To change the lowest IP address that your gateway will issue to your PCs, enter it into the **IP Address** box and then click **Apply**.

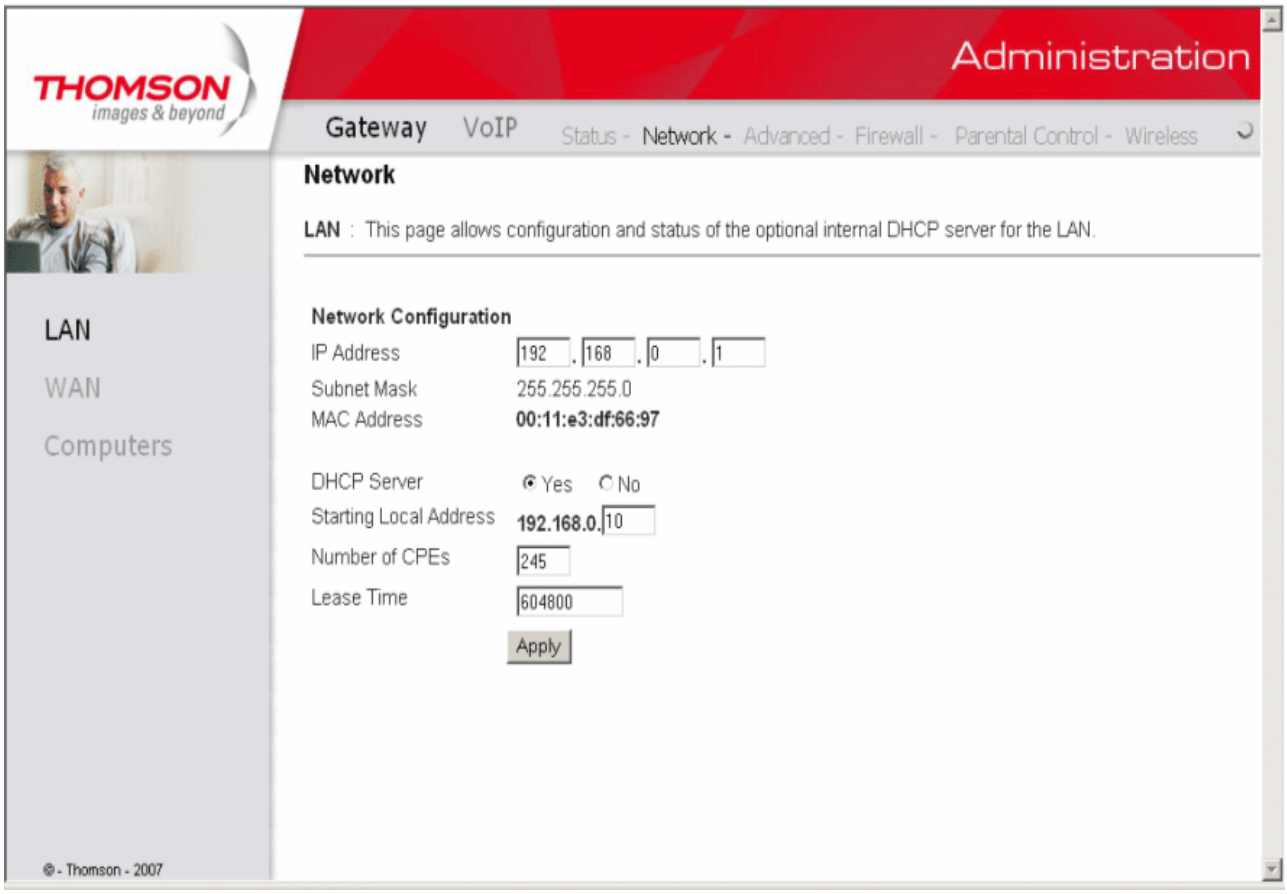

Fig.26

2. WAN

You can configure the optional internal DHCP server for the WAN on this page. Select different WAN Connection Type will lead to different contents. Take the WAN connection type-DHCP for example, you can release and renew the WAN lease by pressing the buttons.

You can enter a spoofed MAC address that causes your gateway networking stack to use that MAC address when communicating instead of the usual WAN MAC address, e.g., if the MAC address is *00:11:e3:df:66:95*, this spoofed MAC address could be *00:11:e3:df:66:97* or any desired MAC address.

Illustrations contained in this document are for representation only.

Chapter 2: WEB Configuration

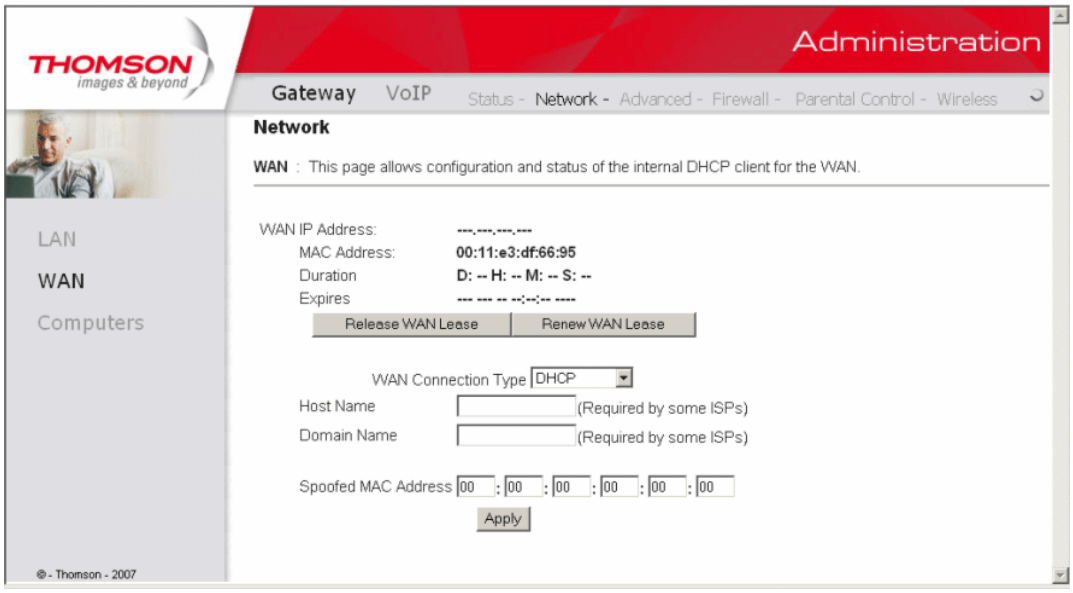
THOMSON
images & beyond
Administration
Gateway VoIP Status - Network - Advanced - Firewall - Parental Control - Wireless
Network
WAN : This page allows configuration and status of the internal DHCP client for the WAN.
LAN
WAN
Computers
WAN IP Address: ---.---.---.---
MAC Address: 00:11:e3:df:66:95
Duration D: -- H: -- M: -- S: --
Expires --- --- -- --:--:-- ----
Release WAN Lease
Renew WAN Lease
WAN Connection Type DHCP
Host Name (Required by some ISPs)
Domain Name (Required by some ISPs)
Spoofed MAC Address 00 : 00 : 00 : 00 : 00 : 00
Apply
© - Thomson - 2007

Fig. 27

3. Computers

This page displays the status of the DHCP clients and current system time. You can cancel an IP address lease by selecting it in the DHCP Client Lease Info list and then clicking the **Force Available** button. If you do so, you may have to perform a DHCP Renew on that PC, so that it can obtain a new lease.

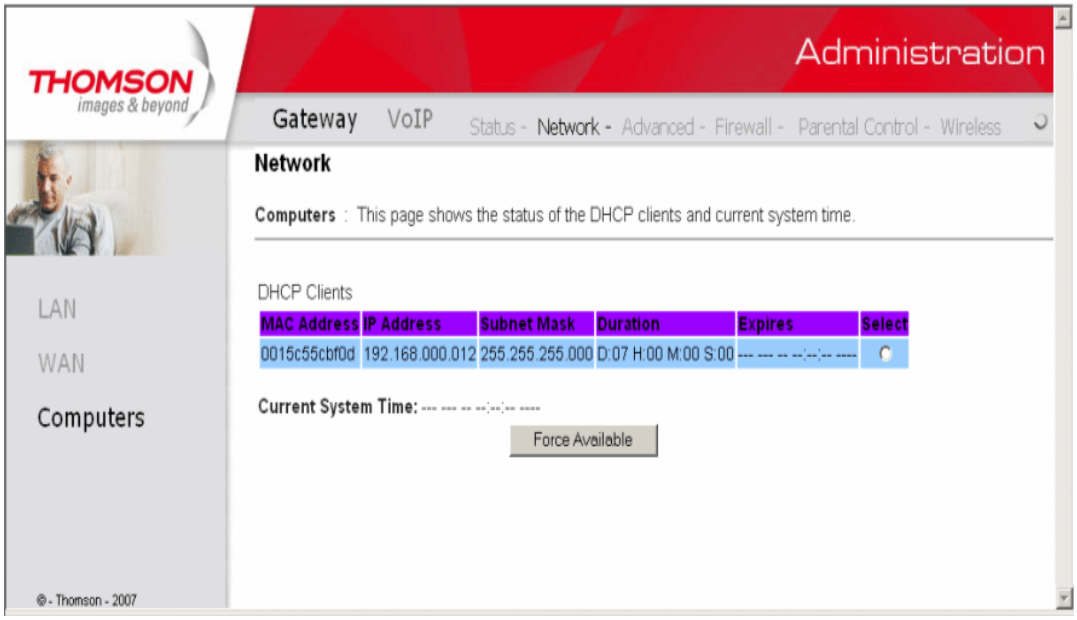
THOMSON
images & beyond
Administration
Gateway VoIP Status - Network - Advanced - Firewall - Parental Control - Wireless
Network
Computers : This page shows the status of the DHCP clients and current system time.
LAN
WAN
Computers
DHCP Clients
MAC Address IP Address Subnet Mask Duration Expires Select
0015c55cbf0d 192.168.000.012 255.255.255.000 D:07 H:00 M:00 S:00 --- --- -- --:--:-- ----
Current System Time: --- --- -- --:--:-- ----
Force Available
© - Thomson - 2007

Fig. 28

Illustrations contained in this document are for representation only.

Gateway – Advanced Web Page Group

1. Options

This page allows you to enable/disable some features of the Wireless Voice Gateway.

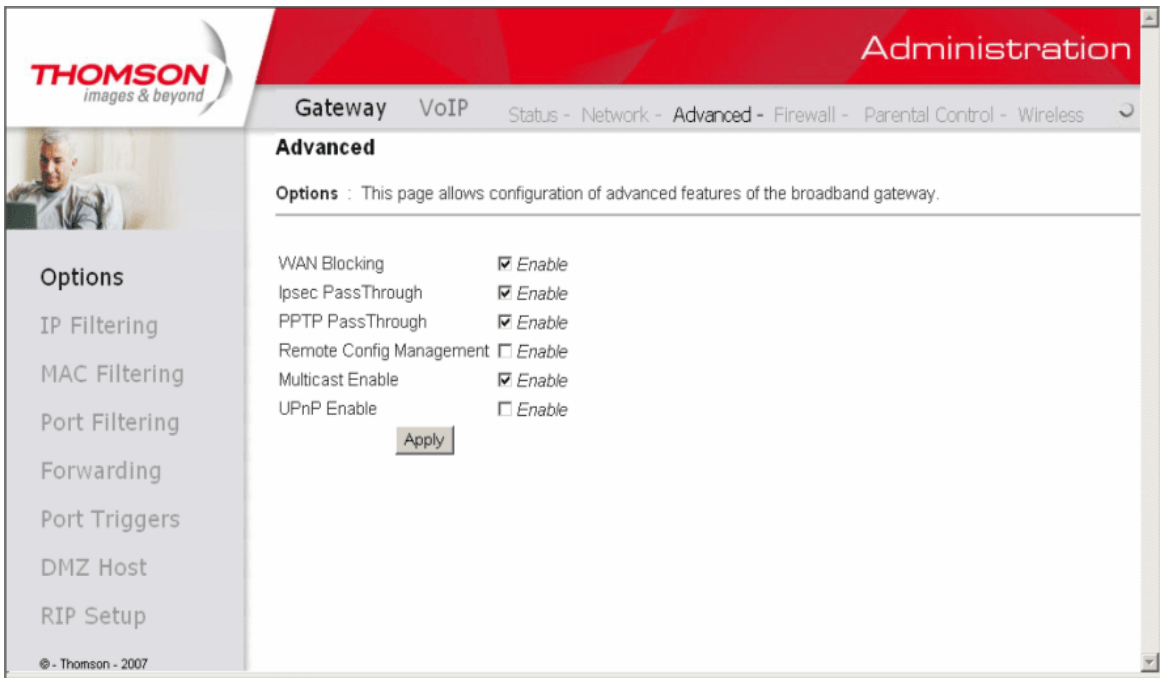

Fig. 29

- **WAN Blocking** prevents others on the WAN side from being able to ping your gateway. With WAN Blocking enabled, your gateway will not respond to pings it receives, effectively "hiding" your gateway.
- **Ipsec PassThrough** enables IpSec type packets to pass WAN ⇔ LAN. IpSec (IP Security) is a security mechanism used in Virtual Private Networks (VPNs).
- **PPTP PassThrough** enables PPTP type packets to pass WAN ⇔ LAN. PPTP (Point to Point Tunneling Protocol) is another mechanism sometimes used in VPNs.
- **Remote Config Management** makes the configuration web pages in your gateway accessible from the WAN side. Note that page access is limited to only those who know the gateway access password. When accessing your gateway from a remote location, your must use HTTP port 8080 and the WAN IP address of the gateway. For example, if the WAN IP address is 157.254.5.7, you would navigate to http://157.254.5.7:8080 to reach your gateway.
- **Multicast Enable** enables multicast traffic to pass WAN⇔ LAN. You may need to enable this to see some types of broadcast streaming and content on the Internet.
- **UPnP** Universal Plug and Play (UPnP) helps devices, such as Internet appliances and computers, access the network and connect to other devices as needed. UPnP devices can automatically discover the services from other registered UPnP devices on the network.

Illustrations contained in this document are for representation only.

Chapter 2: WEB Configuration

2. IP Filtering

This page enables you to enter the IP address ranges of PCs on your LAN that you don't want to have outbound access to the WAN. These PCs can still communicate with each other on your LAN, but packets they originate to WAN addresses are blocked by the gateway.

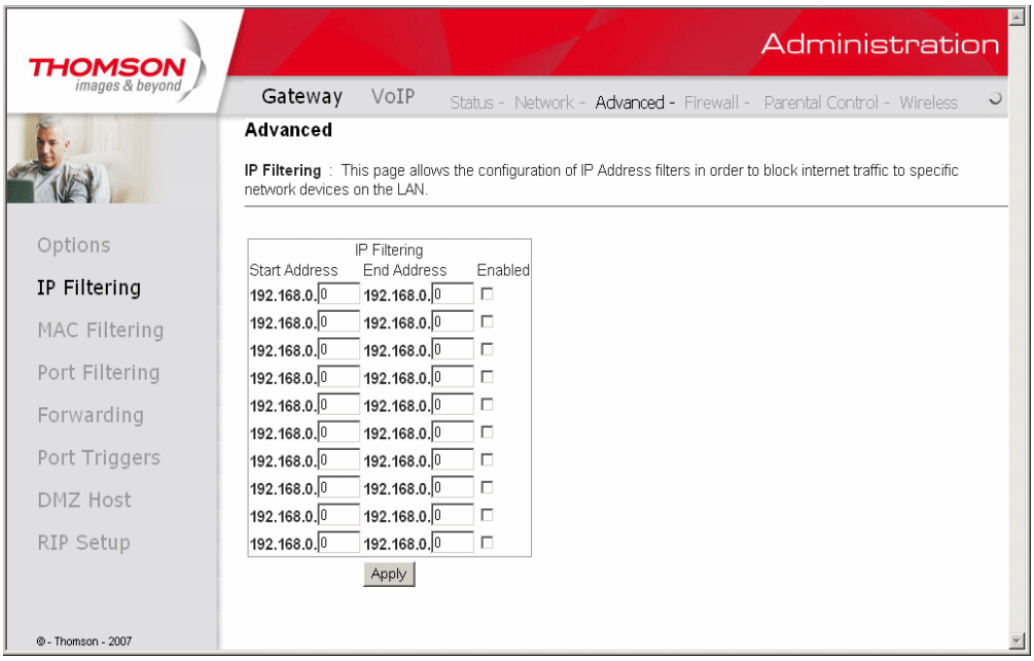

Fig.30

3. MAC Filtering

This page enables you to enter the MAC address of specific PCs on your LAN that you wish to NOT have outbound access to the WAN. As with IP filtering, these PCs can still communicate with each other through the gateway, but packets they send to WAN addresses are blocked.

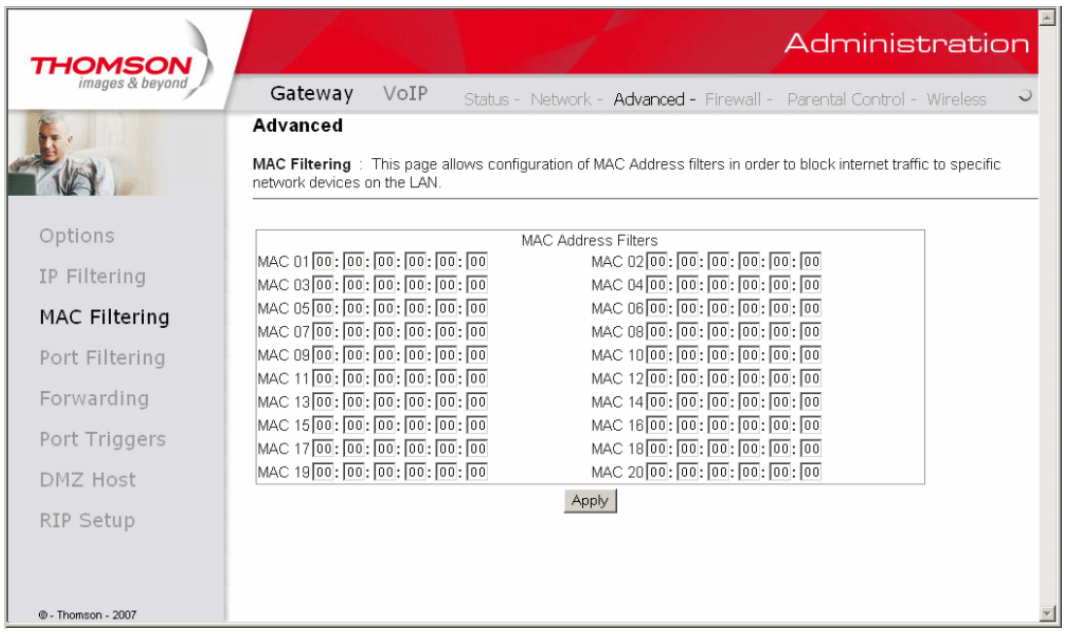

Fig.31

Illustrations contained in this document are for representation only.

4. Port Filtering

This page allows you to enter ranges of destination ports (applications) that you don't want your LAN PCs to send packets to. Any packets your LAN PCs send to these destination ports will be blocked. For example, you could block access to worldwide web browsing (http = port 80) but still allow email service (SMTP port 25 and POP-3 port 110). To enable port filtering, set Start Port and End Port for each range, and click Apply. To block only one port, set both Start and End ports the same.

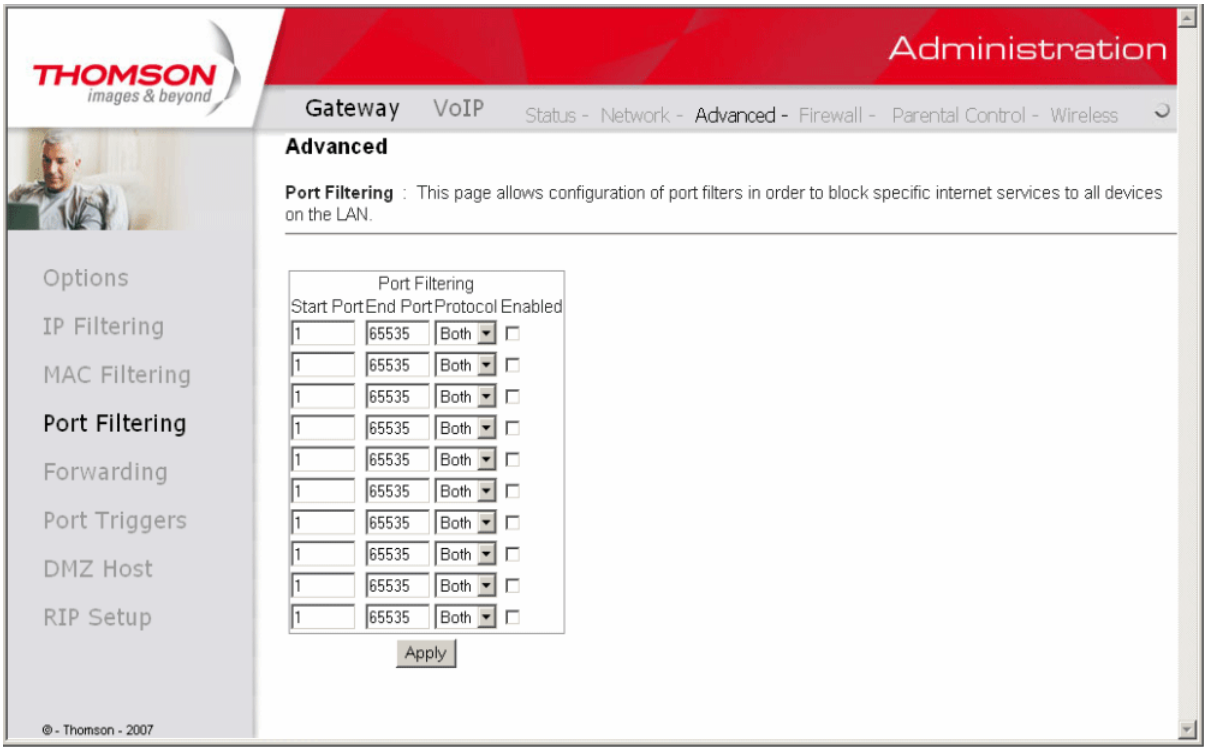

Fig.32

5. Forwarding

For LAN ⇔ WAN communications, the gateway normally only allows you to originate an IP connection with a PC on the WAN; it will ignore attempts of the WAN PC to originate a connection onto your PC. This protects you from malicious attacks from outsiders. However, sometimes you may wish for anyone outside to be able to originate a connection to a particular PC on your LAN if the destination port (application) matches one you specify.

This page allows you to specify up to 10 such rules. For example, to specify that outsiders should have access to an FTP server you have running at 192.168.0.5, create a rule with that address and Start Port =20 and End Port =21 (FTP port ranges) and Protocol = TCP (FTP runs over TCP and the other transport protocol, UDP), and click Apply. This will cause inbound packets that match to be forwarded to that PC rather than blocked. As these connections are not tracked, no entry is made for them in the Connection Table. The same IP address can be entered multiple times with different ports.

Illustrations contained in this document are for representation only.

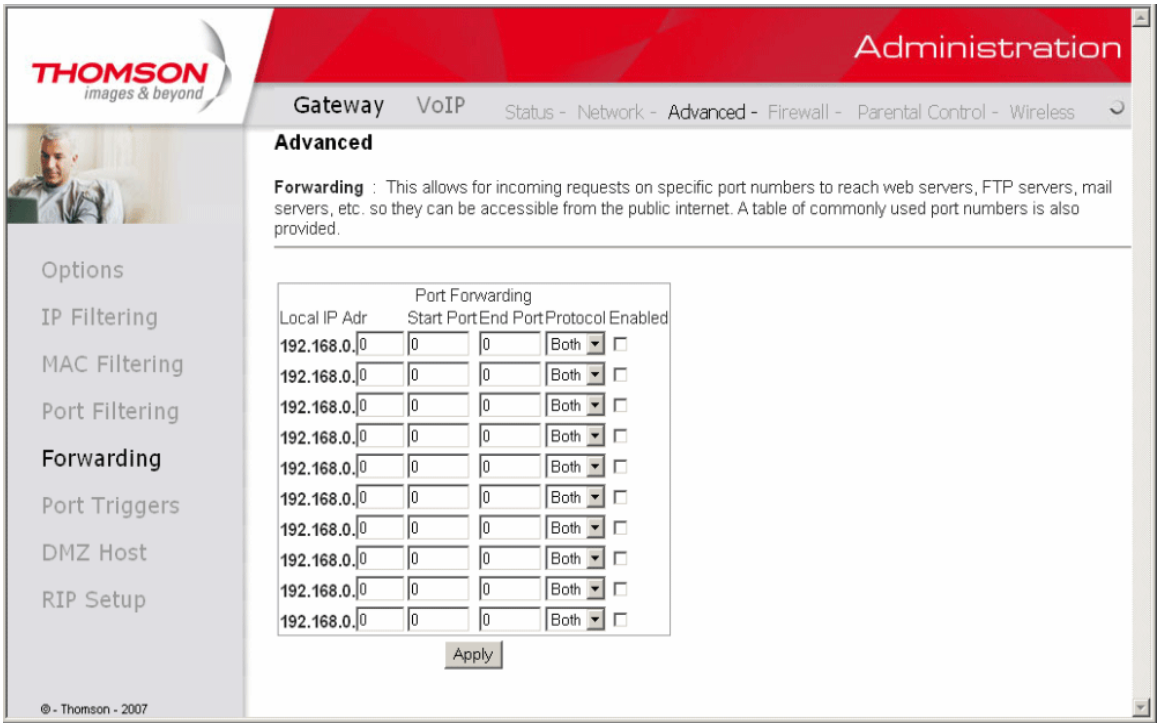

Fig.33

6. Port Triggers

Some Internet activities, such as interactive gaming, require that a PC on the WAN side of your gateway be able to originate connections during the game with your game playing PC on the LAN side. You could use the Advanced-Forwarding web page to construct a forwarding rule during the game, and then remove it afterwards (to restore full protection to your LAN PC) to facilitate this. Port triggering is an elegant mechanism that does this work for you, each time you play the game.

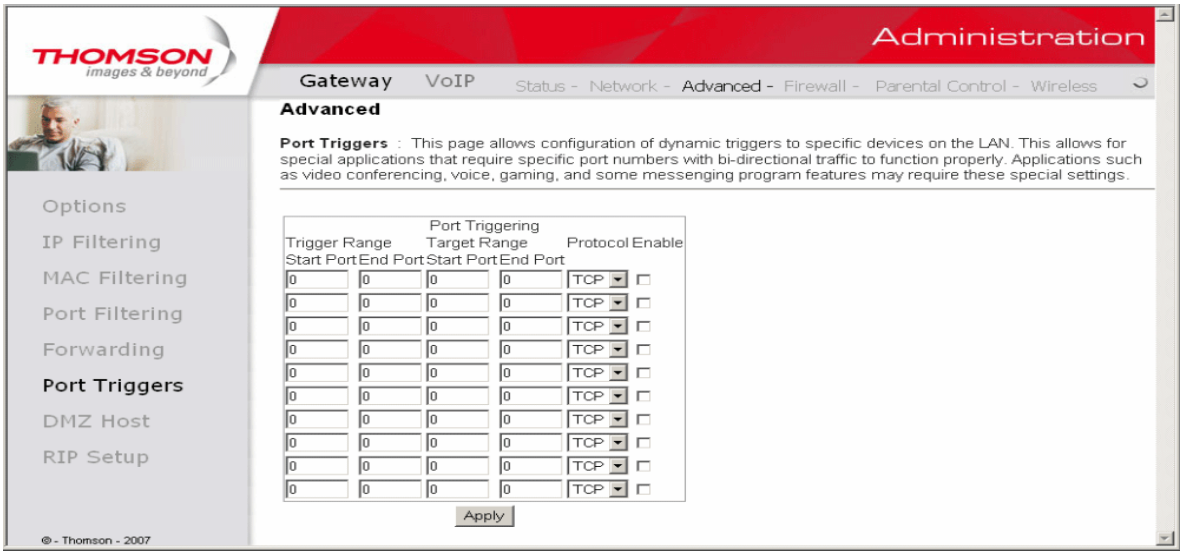

Fig.34

Port Triggering works as follows. Imagine you want to play a particular game with PCs somewhere on the

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Internet. You make one time effort to set up a Port Trigger for that game, by entering into **Trigger Range** the range of destination ports your game will be sending to, and entering into **Target Range** the range of destination ports the other player (on the WAN side) will be sending to (ports your PC's game receives on). Application programs like games publish this information in user manuals. Later, each time you play the game, the gateway automatically creates the forwarding rule necessary. This rule is valid until 10 minutes after it sees game activity stop. After 10 minutes, the rule becomes inactive until the next matched outgoing traffic arrives.

For example, suppose you specify Trigger Range from 6660 to 6670 and Target Range from 113 to 113. An outbound packet arrives at the gateway with your game-playing PC source IP address 192.168.0.10, destination port 666 over TCP/IP. This destination port is within the Trigger destined for port 113 to your game-playing PC at 192.168.0.10.

You can specify up to 10 port ranges on which to trigger.

7. DMZ Host

Use this page to designate one PC on your LAN that should be left accessible to all PCs from the WAN side, for all ports. For example, if you put an HTTP server on this machine, anyone will be able to access that HTTP server by using your gateway IP address as the destination. A setting of "0" indicates NO DMZ PC. "Host" is another Internet term for a PC connected to the Internet.

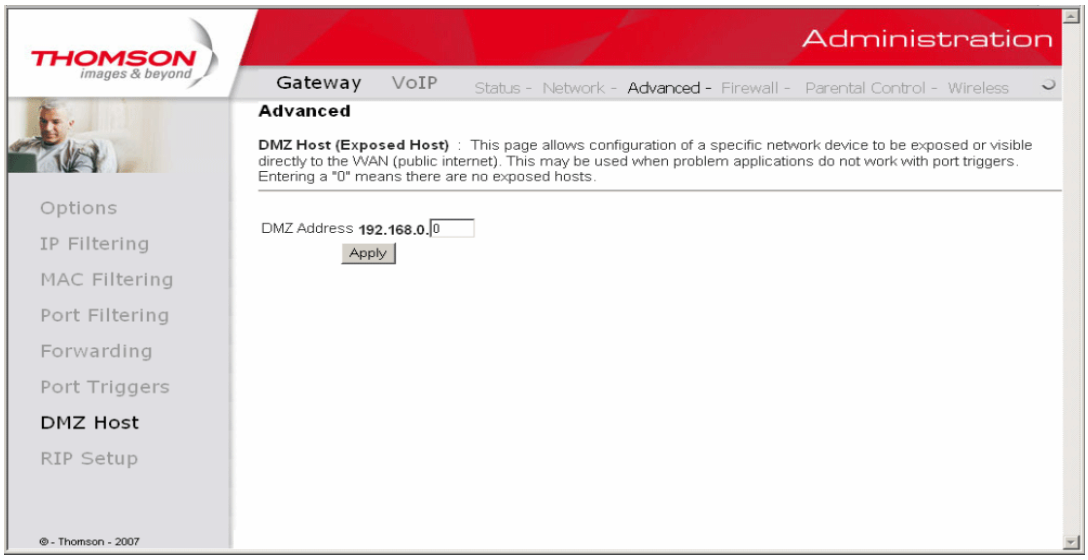
THOMSON
images & beyond
Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Advanced
DMZ Host (Exposed Host) : This page allows configuration of a specific network device to be exposed or visible directly to the WAN (public internet). This may be used when problem applications do not work with port triggers. Entering a "0" means there are no exposed hosts.
DMZ Address 192.168.0.0
Apply
Options
IP Filtering
MAC Filtering
Port Filtering
Forwarding
Port Triggers
DMZ Host
RIP Setup
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Fig.35

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Chapter 2: WEB Configuration

8. RIP (Routing Information Protocol) Setup

This feature enables the gateway to be used in small business situations where more than one LAN (local area network) is installed. The RIP protocol provides the gateway a means to “advertise” available IP routes to these LANs to your cable operator, so packets can be routed properly in this situation.

Your cable operator will advise you during installation if any setting changes are required here.

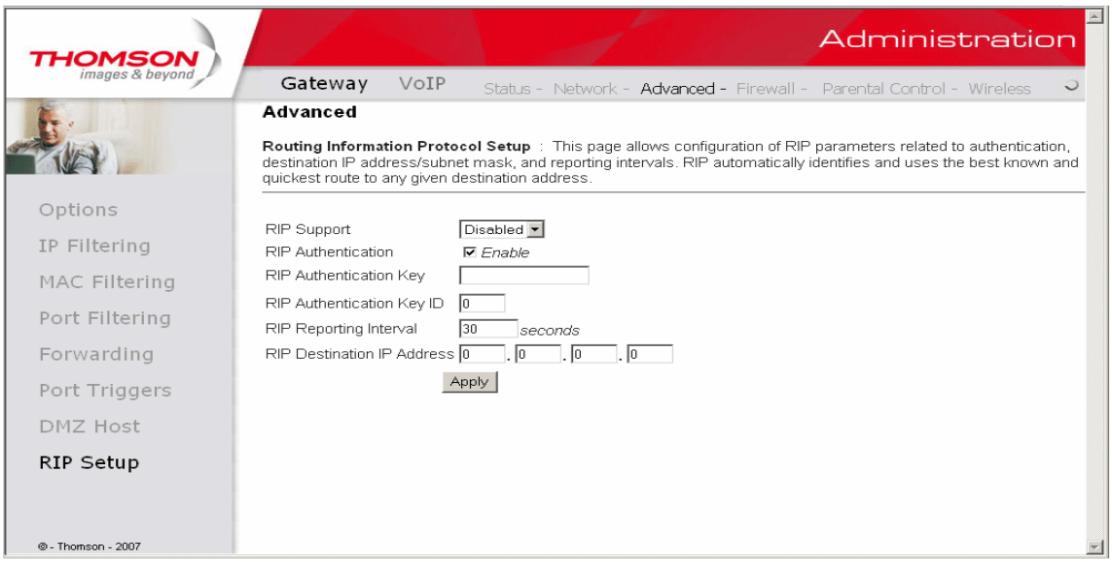

Fig.36

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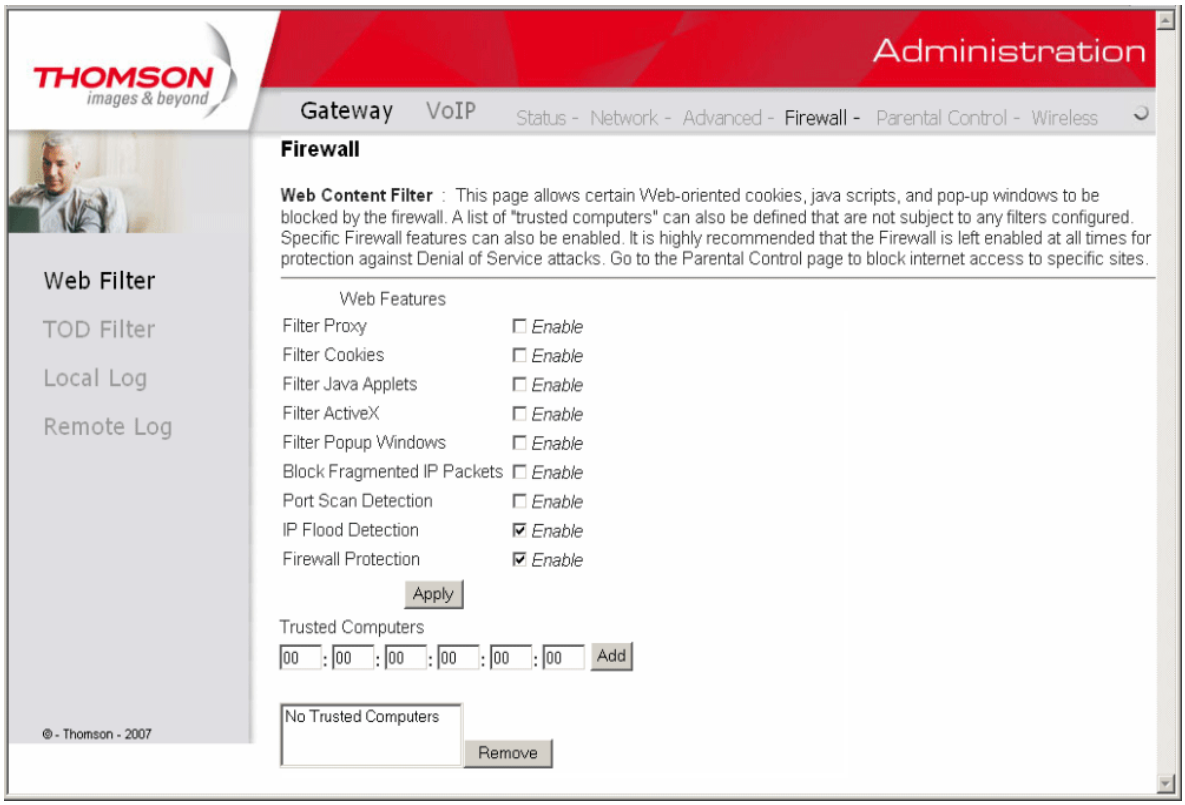
Gateway – Firewall Web Page Group

1. Web Content Filtering

These pages allow you to enable, disable, and configure a variety of firewall features associated with web browsing, which uses the HTTP protocol and transports HTML web pages. On these pages, you designate the gateway packet types you want to have forwarded or blocked. You can activate settings by checking them and clicking Apply.

The web-related filtering features you can activate from the Web Content Filter page include Filter Proxy, Filter Cookies, Filter Java Applets, Filter ActiveX, Filter Popup Windows, and Firewall Protection.

If you want the gateway to exclude your selected filters to certain computers on your LAN, enter their MAC addresses in the Trusted Computers area of this page.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images & beyond
Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Web Filter
TOD Filter
Local Log
Remote Log
© - Thomson - 2007
Firewall
Web Content Filter : This page allows certain Web-oriented cookies, java scripts, and pop-up windows to be blocked by the firewall. A list of "trusted computers" can also be defined that are not subject to any filters configured. Specific Firewall features can also be enabled. It is highly recommended that the Firewall is left enabled at all times for protection against Denial of Service attacks. Go to the Parental Control page to block internet access to specific sites.
Web Features
Filter Proxy Enable
Filter Cookies Enable
Filter Java Applets Enable
Filter ActiveX Enable
Filter Popup Windows Enable
Block Fragmented IP Packets Enable
Port Scan Detection Enable
IP Flood Detection Enable
Firewall Protection Enable
Apply
Trusted Computers
00 : 00 : 00 : 00 : 00 : 00
Add
No Trusted Computers
Remove

Fig.37

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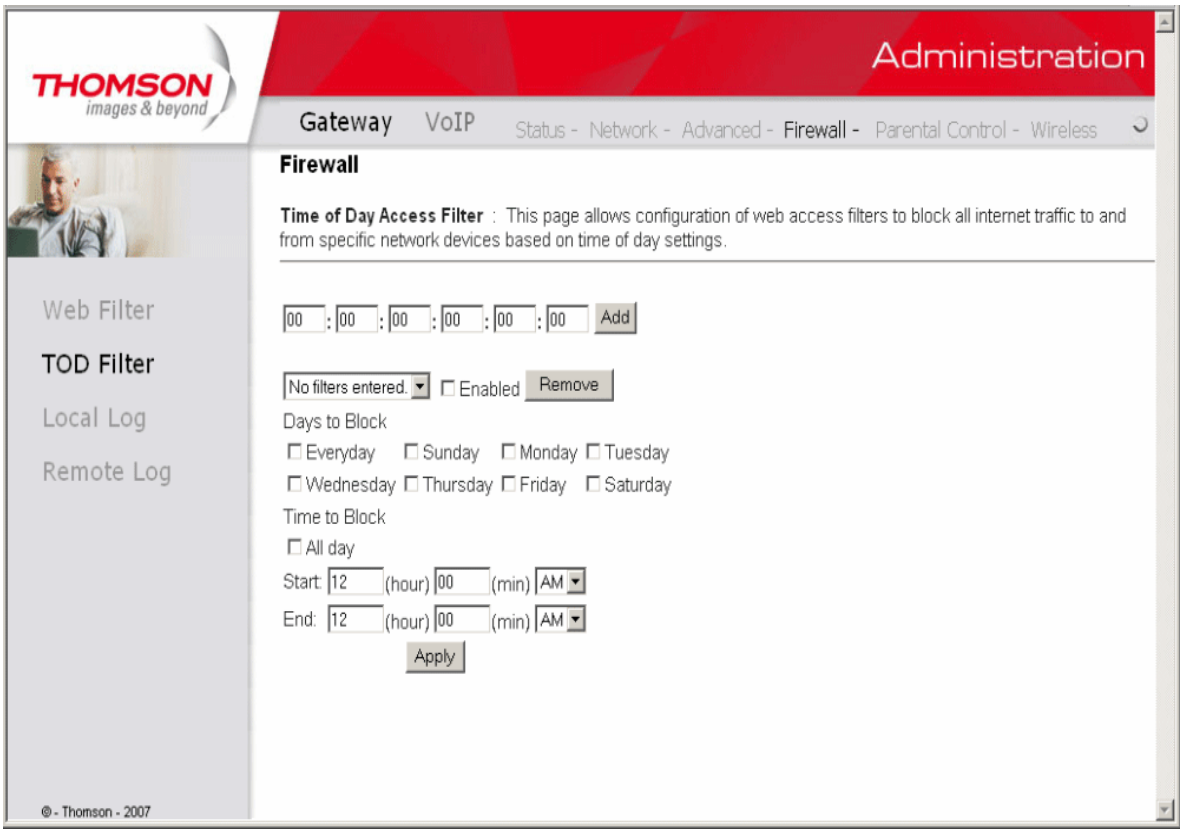
Chapter 2: WEB Configuration

2. TOD Filtering

Use this page to set rules that will block specific LAN side PCs from accessing the Internet, but only at specific days and times. Specify a PC by its hardware MAC address, and then use the tools to specify blocking time. Finally, click the Apply button to save your settings.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Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Firewall
Time of Day Access Filter : This page allows configuration of web access filters to block all internet traffic to and from specific network devices based on time of day settings.
Web Filter
TOD Filter
Local Log
Remote Log
00 : 00 : 00 : 00 : 00 : 00 Add
No filters entered. Enabled Remove
Days to Block
Everyday Sunday Monday Tuesday
Wednesday Thursday Friday Saturday
Time to Block
All day
Start: 12 (hour) 00 (min) AM
End: 12 (hour) 00 (min) AM
Apply
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Fig.38

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3. Local Log and Remote Log

The gateway builds a log of firewall blocking actions that Firewall has taken.Using the Local Log page lets you specify an email address to which you want the gateway to email this log. You must also tell the gateway your outgoing (i.e. SMTP) email server's name, so it can direct the email to it. Enable Email Alerts has the gateway forward email notices when Firewall protection events occur. Click **E-mail Log** to immediately send the email log. Click **Clear Log** to clear the table of entries for a fresh start.

The log of these events is also visible on the screen. For each blocking event type that has taken place since the table was last cleared, the table shows Description, Count, Last Occurrence, Target, and Source.

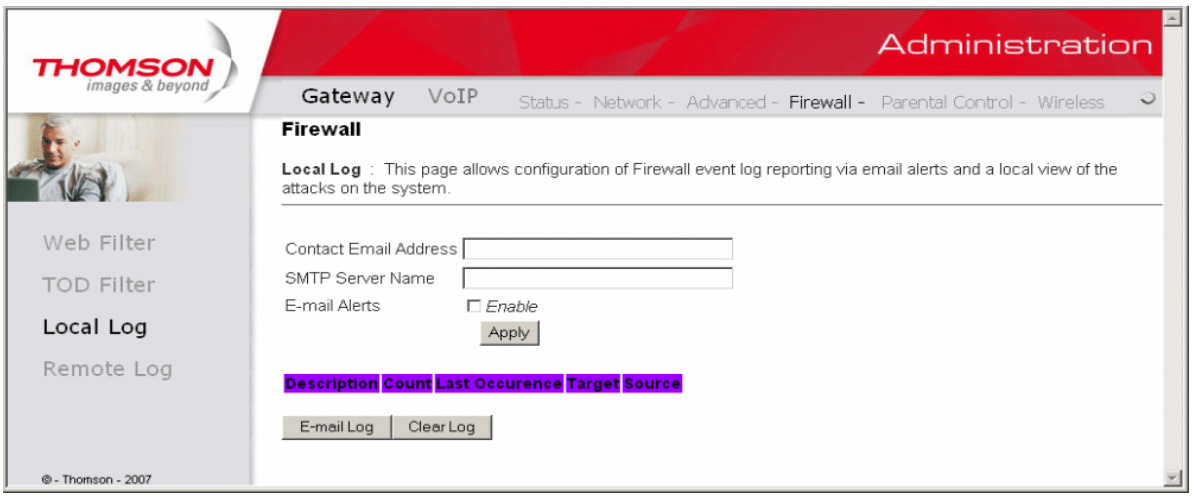

Fig.39

The Remote Log page allows you to specify the IP address where a SysLog server is located and select different types of firewall events that may occur. Then, each time such an event occurs, notification is automatically sent to this log server.

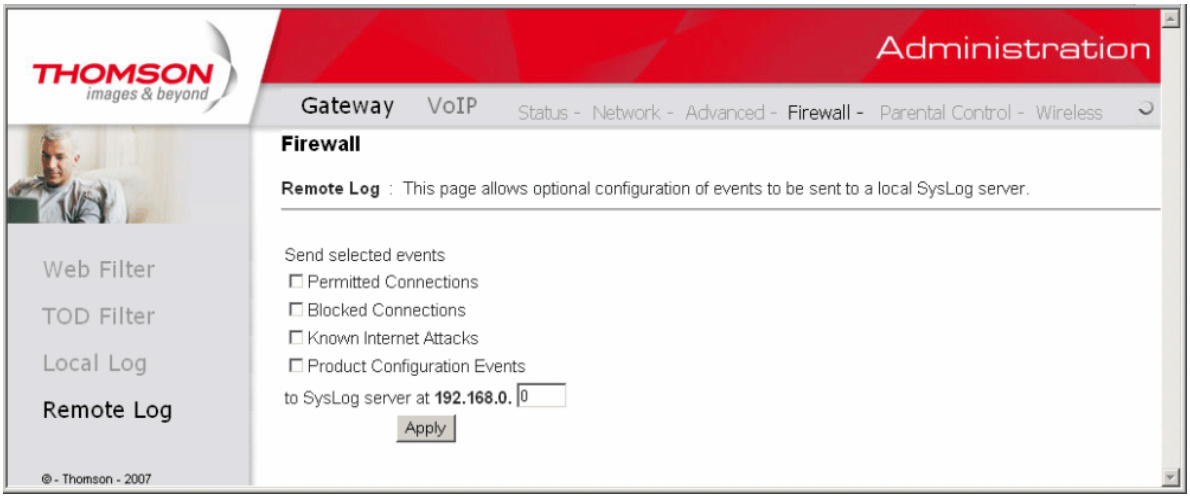

Fig.40

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Chapter 2: WEB Configuration

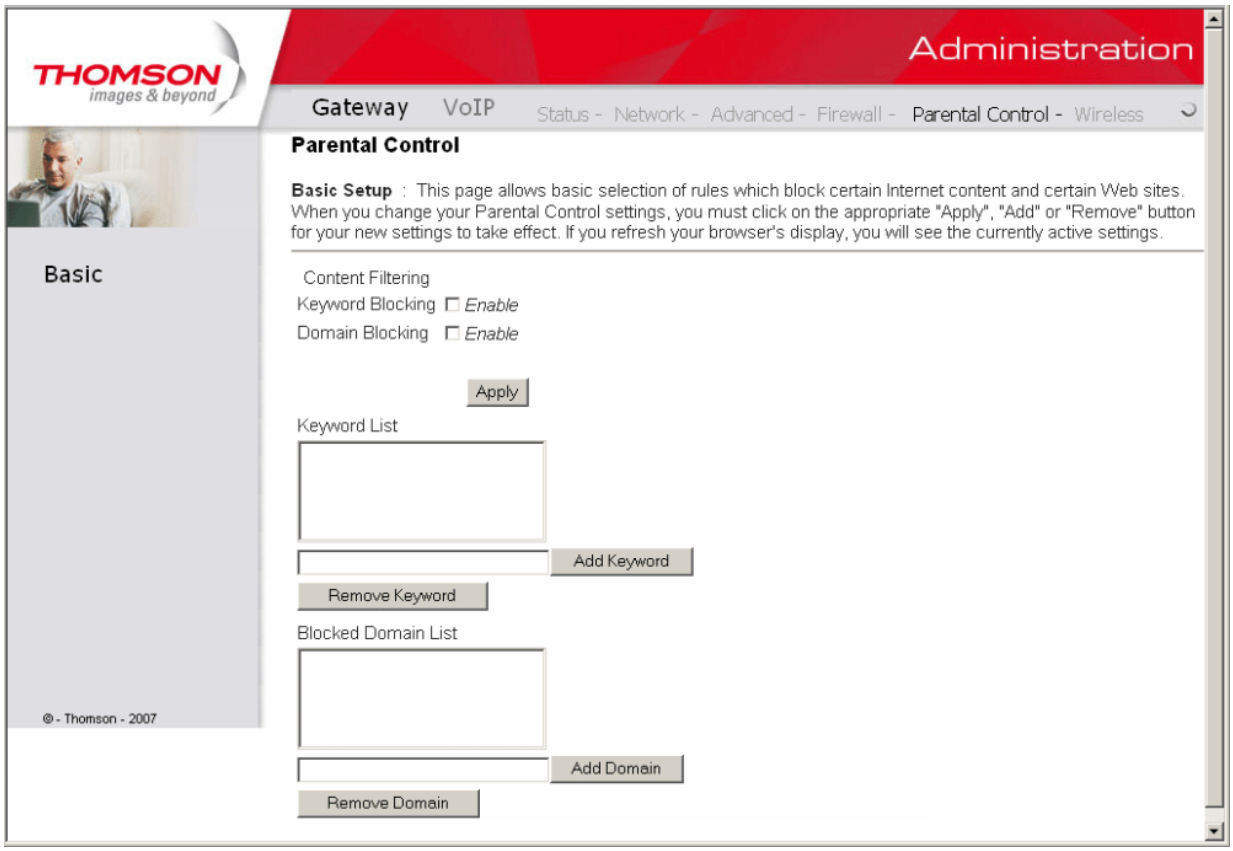
Gateway – Parental Control Web Page Group

1. Basic

This page allows you to enable, disable, and configure a variety of firewall features associated with web browsing, which uses the HTTP protocol and transports HTML web pages. On these pages, you designate the gateway packet types you want to have forwarded or blocked. You can activate settings by checking them and clicking Apply.

Here are some of your choices on the Parental Control page:

- Activate **Keyword Blocking** and specify some keywords in the Keyword List to cause blocking of web pages on the WAN side with the specified keyword in the content.
- Activate **Domain Blocking** and specify some Domain Names (e.g. disney.com) in the Domain List.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images & beyond
Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Parental Control
Basic Setup : This page allows basic selection of rules which block certain Internet content and certain Web sites. When you change your Parental Control settings, you must click on the appropriate "Apply", "Add" or "Remove" button for your new settings to take effect. If you refresh your browser's display, you will see the currently active settings.
Basic
Content Filtering
Keyword Blocking Enable
Domain Blocking Enable
Apply
Keyword List
Add Keyword
Remove Keyword
Blocked Domain List
Add Domain
Remove Domain
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Fig.41

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Gateway – Wireless Web Page Group

Important: Changes to the wireless web pages should be made from a PC that is hard wired to the gateway, i.e. via Ethernet.

The Wireless web pages group enables a variety of settings that can provide secure and reliable wireless communications for even the most demanding tech-savvy user.

The TWG850-4 gateway offers a choice of 802.1x, WPA and WPA-PSK authentication of your PCs to the gateway, 64 and 128 bit WEP encryption of communication between the gateway and your PCs to guaranty security, and an Access Control List function that enables you to restrict wireless access to only your specific PCs.

The wireless function will probably work in your home as shipped from the factory, but without the security features activated. In addition, the factory default wireless channel setting may not provide optimum changes are recommended from the factory defaults, to secure your wireless communications and provide optimum performance.

Performance
Because your wireless communication travels through the air, the factory default wireless channel setting may not provide optimum performance in your home if you or your neighbors have other interfering 2.4GHz devices such as cordless phones. If your wireless PC is experiencing very sluggish or dramatically slower communication compared with the speed you achieve on your PC that is wired to the gateway, try changing the channel number. See the 802.11b/g Basic Web Page discussion below for details.

Authentication
Authentication enables you to restrict your gateway from communicating with any remote wireless PCs that aren't yours. The following minimum authentication-related changes to factory defaults are recommended. See the 802.11b/g Basic and Access Control Web Page discussions below for details.

Network Name (SSID) – Set a unique name you choose

Network Type – Set to Open

Access Control List – Enter your wireless PCs' MAC addresses

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Chapter 2: WEB Configuration

Security

Security secures or scrambles messages traveling through the air between your wireless PCs and the gateway, so they can't be observed by others. The following minimum security setting changes to factory defaults are recommended. See the 802.11b/g Security Web Page discussion below for details.

Data Encryption – Set to WEP (64-bit)

PassPhrase – Use this feature to generate security keys

1. 802.11 Radio

This page allows configuration of the Wireless Radio including current country and channel number.

Press "**Apply**" button to enable the new setting that you have changed or press "**Restore Wireless Defaults**" button to restore to defaults setting.

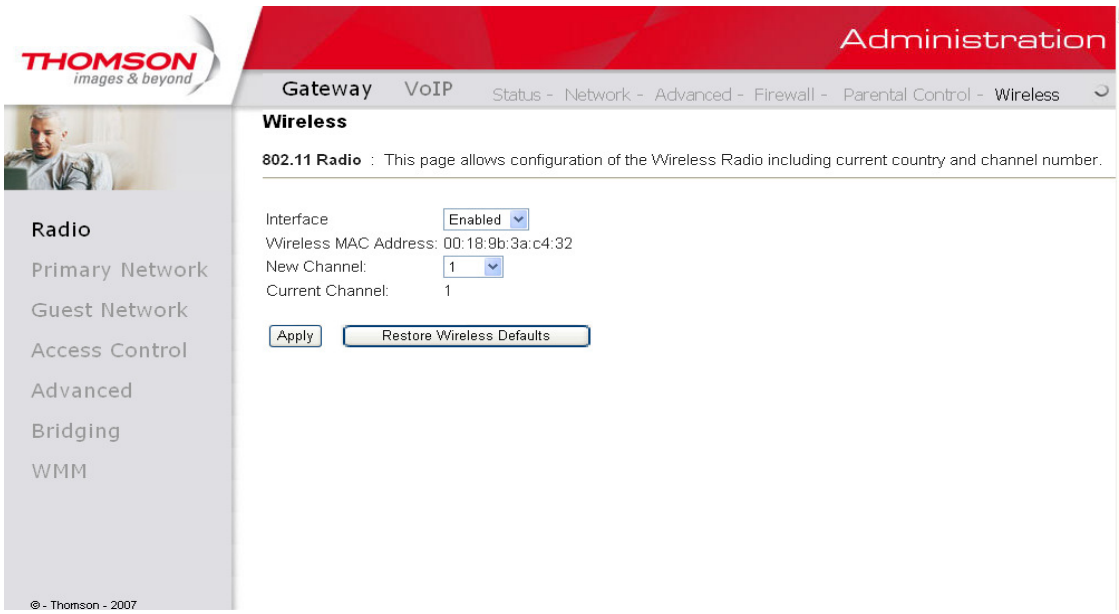

Fig.42

- **Interface**: The wireless radio in your gateway can be completely de-activated by changing **Interface** to Disabled. Click the **Apply** button to save your settings. If you want to re-activate the disabled wireless radio in your gateway, need to contact cable operator.
- **Wireless MAC Address**: The MAC address for this wireless device will be displayed in this field automatically.
- **New Channel**: There are 13 channels that you can choose. Choose the one that is suitable for this device.
- **Current Channel**: The channel that you choose will be displayed in this field.

Restore Wireless defaults: To recover to the default settings, press this button to retrieve the settings and click Apply.

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2. 802.11 Primary Network

This page allows you to configure the Network Authentication. Here provides several different modes of wireless security. You will have to enter proper information according to the mode you select.

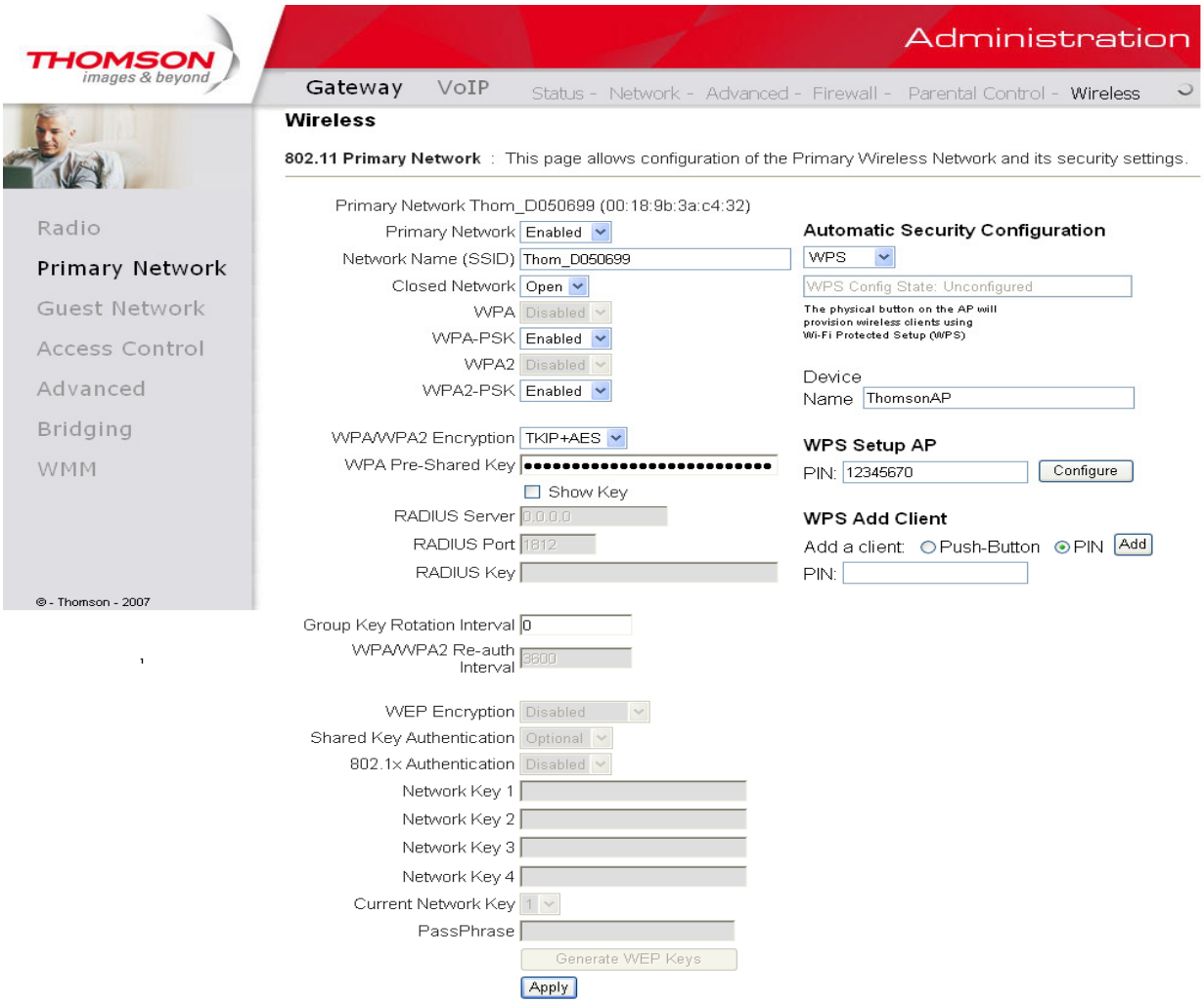

Fig.43

Primary Network: It is used to Enable or Disable the whole Primary Network feature.

Network Name (SSID): By using this you can change the factory default to a name of your choice up to 32 characters long.

Closed Network: This control is used to hide or reveal your network name (SSID) to any remote, wireless equipped PC in the area that may be scanning WiFi channels to find available WiFi networks. The gateway WiFi radio frequently transmits a beacon signal which can contain this network name (SSID). If you set Closed Network to Enable, your SSID is included in that beacon, and is therefore detectable by any nearby wireless equipped PCs in the area. The benefit of using Enable is it can speed your WiFi setup on some PCs. If you set Closed Network to Disable, your SSID is not included in the beacon. This hides your network name (SSID), but as a result may require a bit more effort on your part to set up your wireless PCs. And when we Enable the

WPS Config then the **Closed Network** will be Disabled automatically.

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WPA (Wi-Fi Protected Access)/**WPA2**:

It must be used in conjunction with an authentication server such as RADIUS to provide centralized access control and management. It can provide stronger encryption and authentication solution than none WPA modes. **WPA2** is the second generation of **WPA** security

WPA-PSK (WPA-Pre-Shared Key) **/WPA2-PSK** (WPA2-Pre-Shared Key)**:**
It is useful for small places without authentication servers such as the network at home. It allows the use of manually-entered keys or passwords and is designed to be easily set up for home users.

WEP Encryption:

You can choose **64-bit** or **128-bit** according to your needs. If you choose **Disabled**, the Network Keys will not be shown on this page. If selected, the data is encrypted using the key before being transmitted. For example, if you set 128-bit in this field, then the receiving station must be set to use the128 Bit Encryption, and have the same Key value too. Otherwise, it will not be able to decrypt the data.
(*Note: You need to connect one end of the Ethernet cable to the Ethernet port on the back of your computer, and the other end to the ETHERNET port on the Residential Voice Gateway.*)

- If you select WEP (**64-bit** or **128-bit**), you can adjust the following settings-
- **Shared Key Authentication**: Decide whether to set the shared key **Optional** or **Required** by selecting from the drop-down menu.
- **Network Key 1 to 4:** The system allows you to enter four sets of the WEP key. For **64-bit** WEP mode, the key length is 5 characters or 10 hexadecimal digits. As for **128-bit** WEP mode, the key length is 13 characters or 26 hexadecimal digits.
- **Current Network Key**: Select one set of the network key (from 1 to 4) as the default one.
- **PassPhrase**: You can enter ASCII codes into this field. The range is from 8 characters to 64 characters. For ASCII characters, you can key in 63 characters in this field. If you want to key in 64 characters, only hexadecimal characters can be used.
- **Generate WEP Keys**: Click this button to generate the PassPhrase.

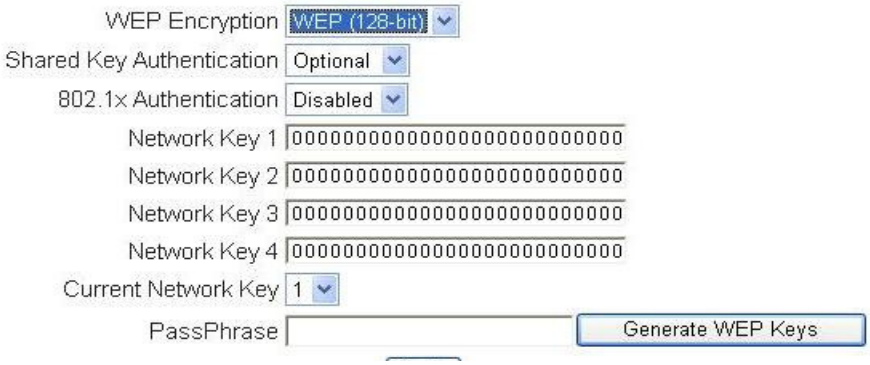

Fig.44

- **Apply:** After proper configuration, click Apply to invoke the settings.

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802.1x Authentication

If you enable the **802.1x authentication** function, you will have to offer the following information-

- **RADIUS Server:** RADIUS Server is a protocol for carrying authentication, authorization, and configuration information between a Network Access Server which desires to authenticate its links and a shared Authentication Server. Please key in the IP Address for the RADIUS Server.
- **RADIUS Port:** Besides the IP address of the RADIUS Server, you have to enter the port number for the server. Port 1812 is the reserved RADIUS-authentication port described in RFC 2138. Earlier AP (RADIUS clients) use port 1945. The default value will be shown on this box. You can keep and use it.
- **RADIUS Key:** A RADIUS Key is like a password, which is used between IAS and the specific RADIUS client to verify identity. Both IAS and the RADIUS client must be use the same RADIUS Key for successful communication to occur. Enter the RADIUS Key.

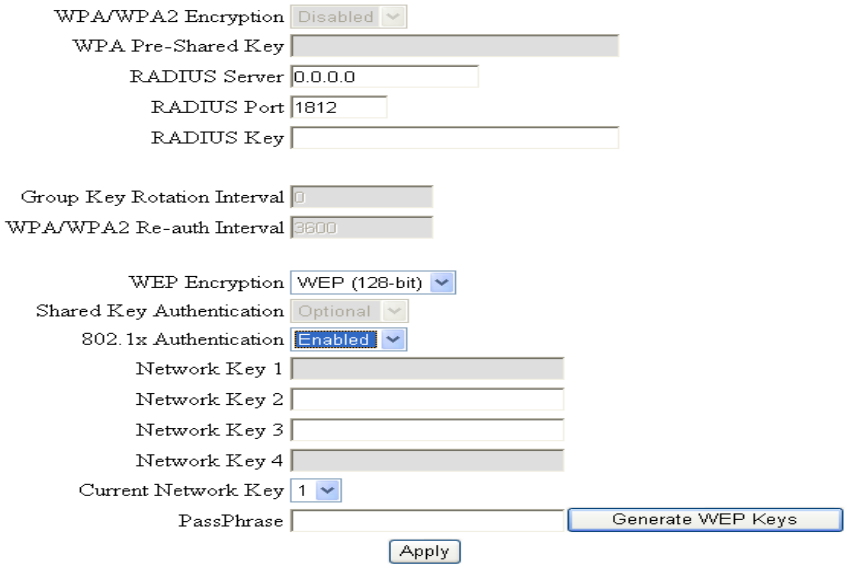

Fig.45

WPA/WPA2

For the WPA/WPA2 network Authentication, the settings that you can adjust including WPA/WPA2 Encryption, RADIUS Server, RADIUS Port, RADIUS Key, Group Key Rotation Interval, and WPA/WPA2 Re-auth Interval.

- **WPA/WPA2 Encryption:** There are three types that you can choose, **TKIP***, **AES****, **TKIP+AES**.

  TKIP takes the original master key only as a starting point and derives its encryption keys mathematically from this mater key. Then it regularly changes and rotates the encryption keys so that the same encryption key will never be used twice

  **** AES provides security between client workstations operating in ad hoc mode. It uses a mathematical ciphering algorithm that employs variable key sizes of 128, 192 or 256 bits.**
- **RADIUS Server/RADIUS Port/RADIUS Key: Please refer to the previous page.**

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- **Group Key Rotation Interval**: Key in the time for the WAP group key rotation interval. The unit is second. With increasing rekey interval, user bandwidth requirement is reduced.
- **WPA/WPA2 Re-auth Interval**: When a wireless client has associated with the Residential Voice Gateway for a period of time longer than the setting here, it would be disconnected and the authentication will be executed again. The default value is *3600*, you may modify it.

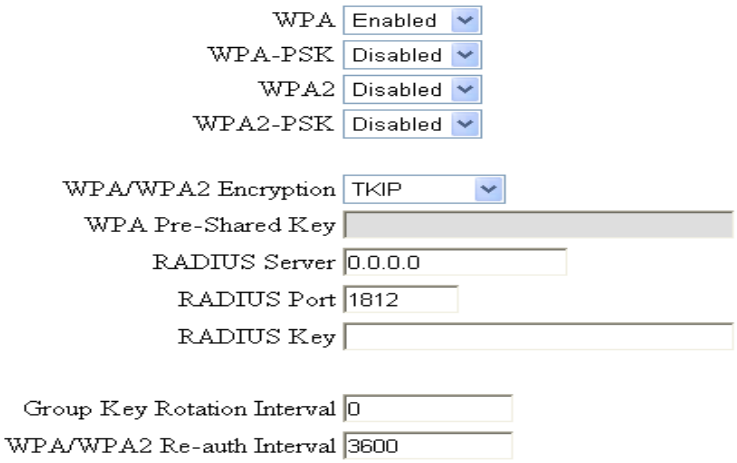

Fig.46

WPA-PSK/ WPA2-PSK

For the WPA-PSK/WPA2-PSK network Authentication, the settings that you can adjust including WPA/WPA2 Encryption, WPA Pre-Shared Key, and Group key Rotation Interval.

- WPA Pre-Shared Key: Please type the key to be between 8 and 63 characters, or 64 hexadecimal digits. Only the devices with a matching key that you set here can join this network.
- WPA/WPA2 Encryption & WPA Group Rekey Interval: **Please refer to the WPA/WPA2 part.**

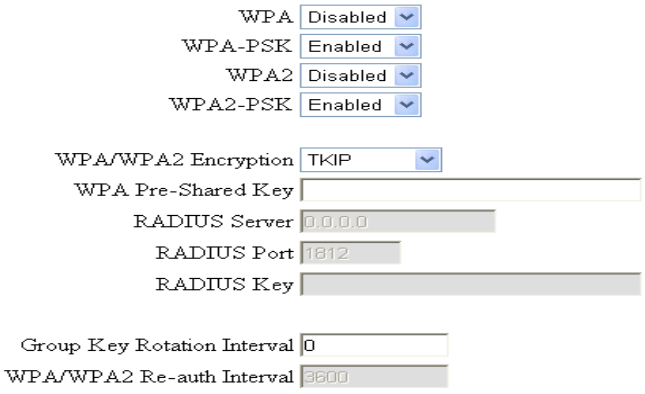

Fig.47

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THOMSON images & beyond

Automatic Security Configuration

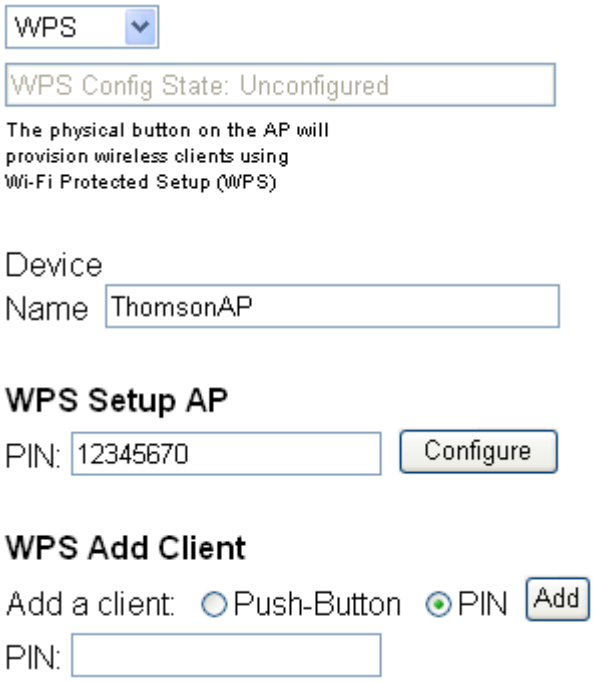

Fig.48

WiFi Protected Setup (WPS): It is a secure way of configuring and connecting your WiFi access point.

- **WPS Config:** It will help to **Enable** or **Disable** the WPS feature.
- **Device Name:** By using this you can change the factory default to a name of your choice up to 32 characters long as like **SSID**
- **WPS Setup AP:** Here we no need to do any configure. So, just skip this step.
- **WPS Add Client:** There are two methods "Push-Button" and "PIN". Select the method you want.
  If you select "Push-Button", then the **WPS Setup AP** page will appear as shown below.

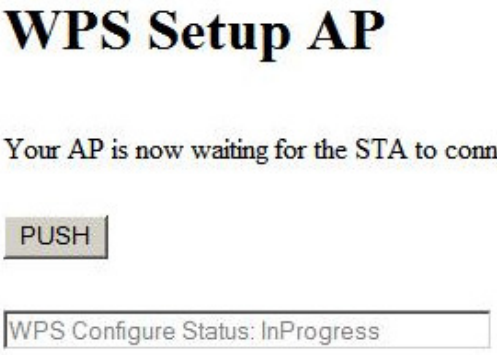

Fig.49

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And **WPS Configure Status** will be "In progress", after establishing the connection the **WPS Configure Status** will be "Success!". If you select **WPS Method** to PIN then It will ask for PIN while configuring the WiFi AP by showing a text box so, you need to enter that PIN to establish the connection. You can get the PIN from client.

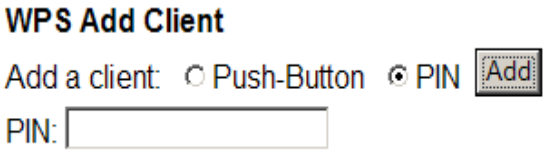

Fig. 50

- **PIN:** Use this option to set the PIN, enter 4-8 digits PIN of the device you wish to configure. After entering the pin click "Add" button, then the WPS Setup AP page will appear as shown below and the status will be "In progress", after establishing the connection the WPS Configure Status will be "Success!".

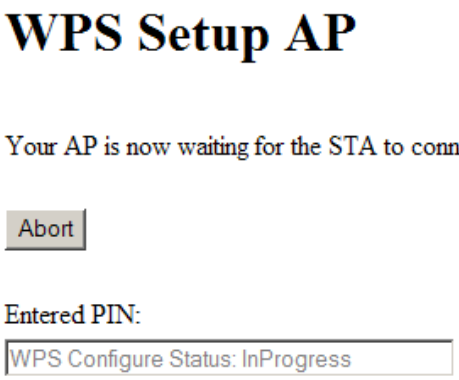

Fig. 51

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3. Guest Networks

If enabled by the service provider, there are 3 additional Wireless Guest Networks can be configured and activated. The default guest network screen looks as follow:

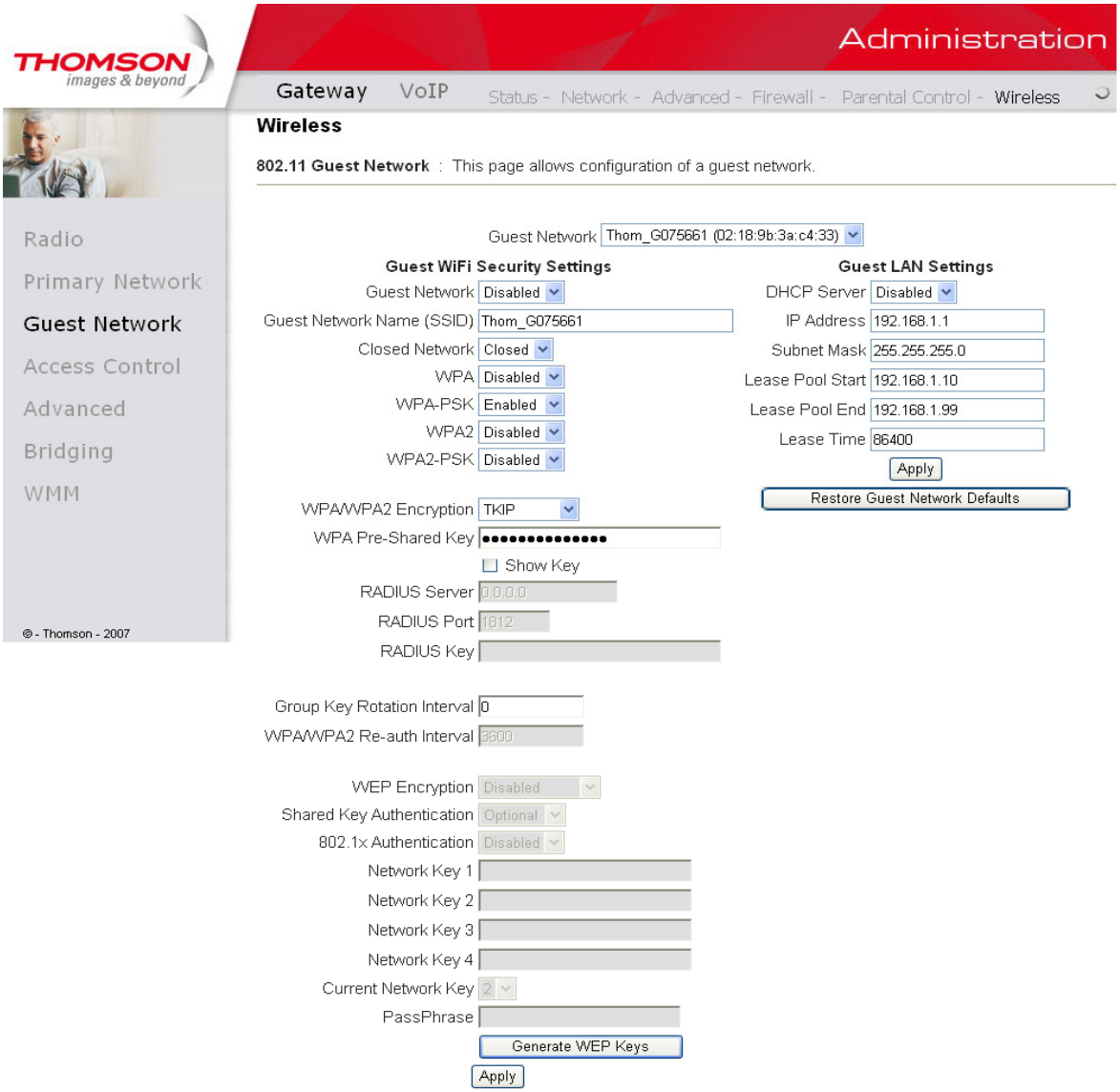

Fig. 52

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Chapter 2: WEB Configuration

4. 802.11 Access Control

This page allows you to make access control to the AP or connected clients by offering the MAC Addresses of the clients.

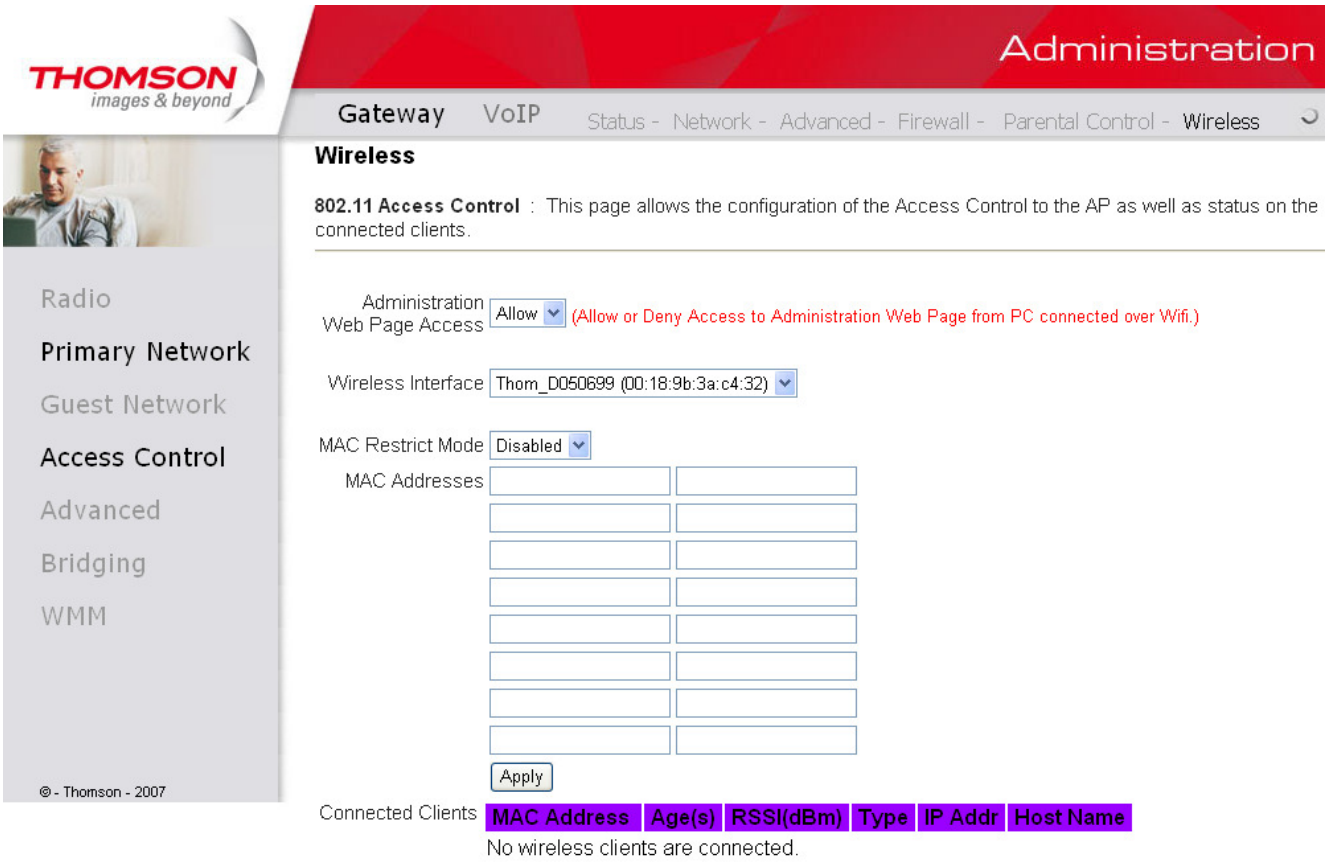

Fig. 53

MAC Restrict Mode : Click **Disabled** to welcome all of the clients on the network; select **Allow** to permit only the clients on the list to access the cable modem; or choose **Deny** to prevent the clients on the list to access this device.

MAC Address : Your Gateway identifies wireless PCs by their WiFi MAC Address. This address consists of a string of 6 pairs of numbers 0-9 and letters A-F, such as 00 90 4B F0 FF 50. It is usually printed on the WiFi card of the device (e.g. the PCMCIA card in a laptop). It can also be determined from a Windows DOS prompt as explained below.

Enter the MAC addresses of the connected clients into the fields, and then click Apply to add them to the list for access control.

Apply : After proper configuration, click Apply to invoke the settings.

Connected Clients : The information of currently connected clients will be displayed here.

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5. 802.11 Advanced

This page allows you to configure some advanced settings. The factory default values should provide good results in most cases. We don't recommend you change these settings unless you have technical knowledge of 802.11b wireless technology.

For expert users, details of all settings on this web page are provided below.

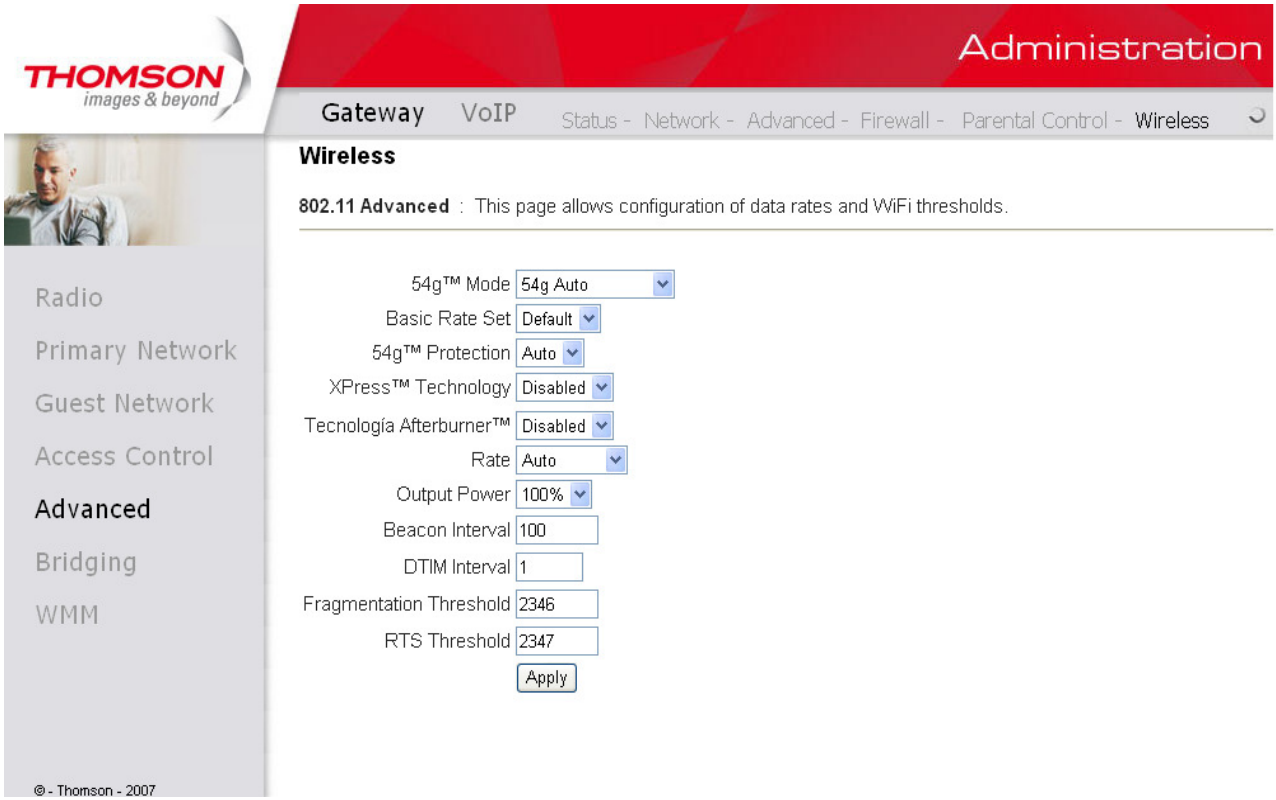

Fig. 54

Beacon Interval:

Set the period of beacon transmissions to allow mobile stations to locate and identify a BSS. The measure unit is "time units" (TU) of 1024 microseconds. (Value range: 1~65535)

DTIM Interval:

The value you set here is used to inform mobile stations when multicast frames that have been buffered at the Wireless Voice Gateway will be delivered and how often that delivery occurs. (Value range: 1~255)

Fragmentation Threshold:

Set the number of the fragmenting frames to make the data to be delivered without errors induced by the interference. Frames longer than the value you set here are fragmented before the initial transmission into fragments no longer than the value of the threshold. (Value range: 256~ 2346)

RTS Threshold:

Set the value for sending a request to the destination. All the frames of a length greater than the threshold that you set here will be sent with the four-way frame exchange. And, a length less than or equal to the value that you set will not be proceeded by RTS. (Value range: 0~ 2347)

Illustrations contained in this document are for representation only.

54g™ Network Mode:
There are three modes for you to choose, please check the specification of your wireless card and choose a proper setting.

54g™ Protection:
Select **Auto** to turn on the 54g™ protection; select **Off** to turn down the protection.

Xpress™ Technology:
When Xpress is turned on, aggregate throughput (the sum of the individual throughput speeds of each client on the network) can improve by **up to** 27% in 802.11g-only networks, and **up to** 75% in mixed networks comprised of 802.11g and 802.11b standard equipment.

Rate:
It decides the speed of data transmission. There are several rates provided here for you to choose. Choose any one of it according to your needs by using the drop-down menu.

Output Power:
This setting decides the output power of this device. You may use it to economize on electricity by selecting lower percentage of power output.

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6. Bridging

The Bridging page provides a location where settings can be adjusted related to the WDS (**Wireless Distribution System)** feature.

WDS is a system that enables the interconnection of access points wirelessly. It may also be referred to as repeater mode because it appears to bridge and accept wireless clients at the same time (unlike traditional bridging).

The wireless gateway can be placed in a mode that allows the gateway to communicate with other "extender" wireless access points either exclusively or mixed with communications to local PCs. Use this page to designate the Remote Bridges the gateway is allowed to communicate with, and to select the Wireless Bridging mode.

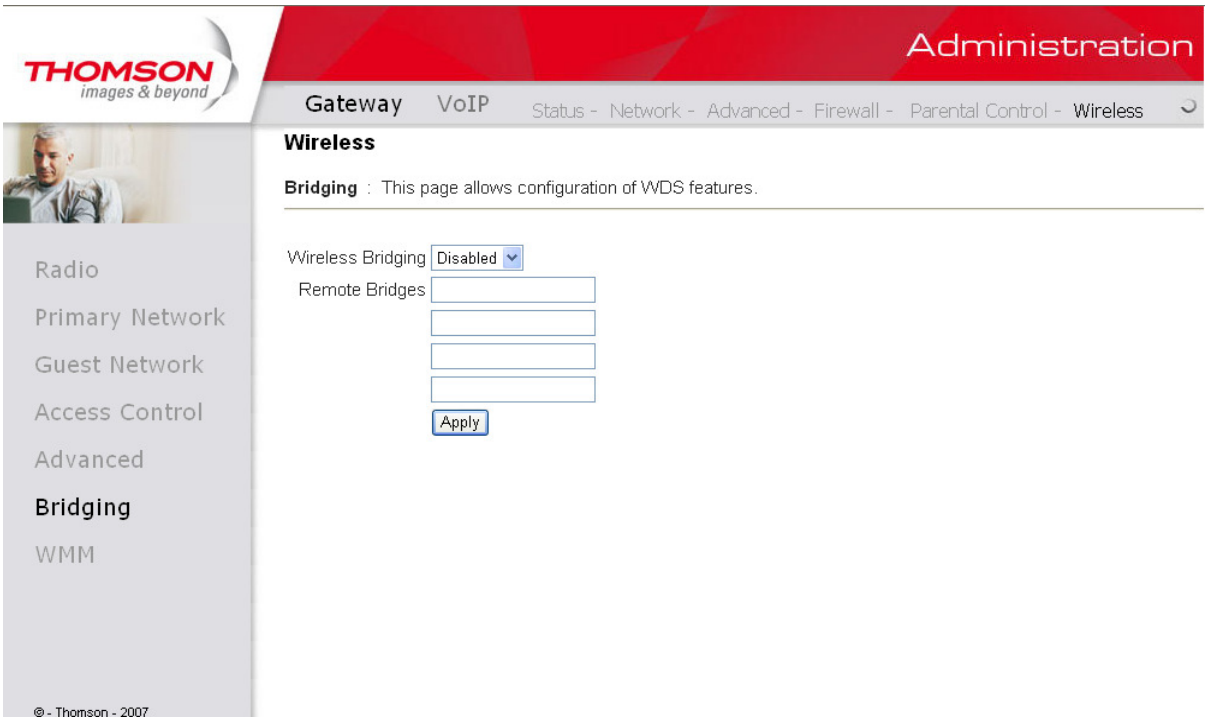

Fig. 55

- **Wireless Bridging:**
  Choose **Disabled** to shutdown this function; select **Enabled** to turn on the function of WDS.
- **Remote Bridges**:
  Enter the MAC Addresses of the remote Bridges to relay the signals for each other.
- **Apply:**
  After proper configuration, click Apply to invoke the settings.

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Chapter 2: WEB Configuration

7. 802.11 Wi-Fi Multimedia (WMM) Settings

Wi-Fi Multimedia (WMM) is a component of the IEEE 802.11e wireless LAN standard for quality of service (QoS). The QoS assigns priority to the selected network traffic and prevents packet collisions and delays thus improving VoIP calls and watching video over WLANs.

- **Enable WMM:**
  This field allows you to enable WMM to improve multimedia transmission.
- **Enable WMM No-Acknowledgement**:
  This field allows you to enable WMM No-Ackonwledgement.
- **Power Save Support:**

  This field allows you to enable WMM Power-Save-Support.

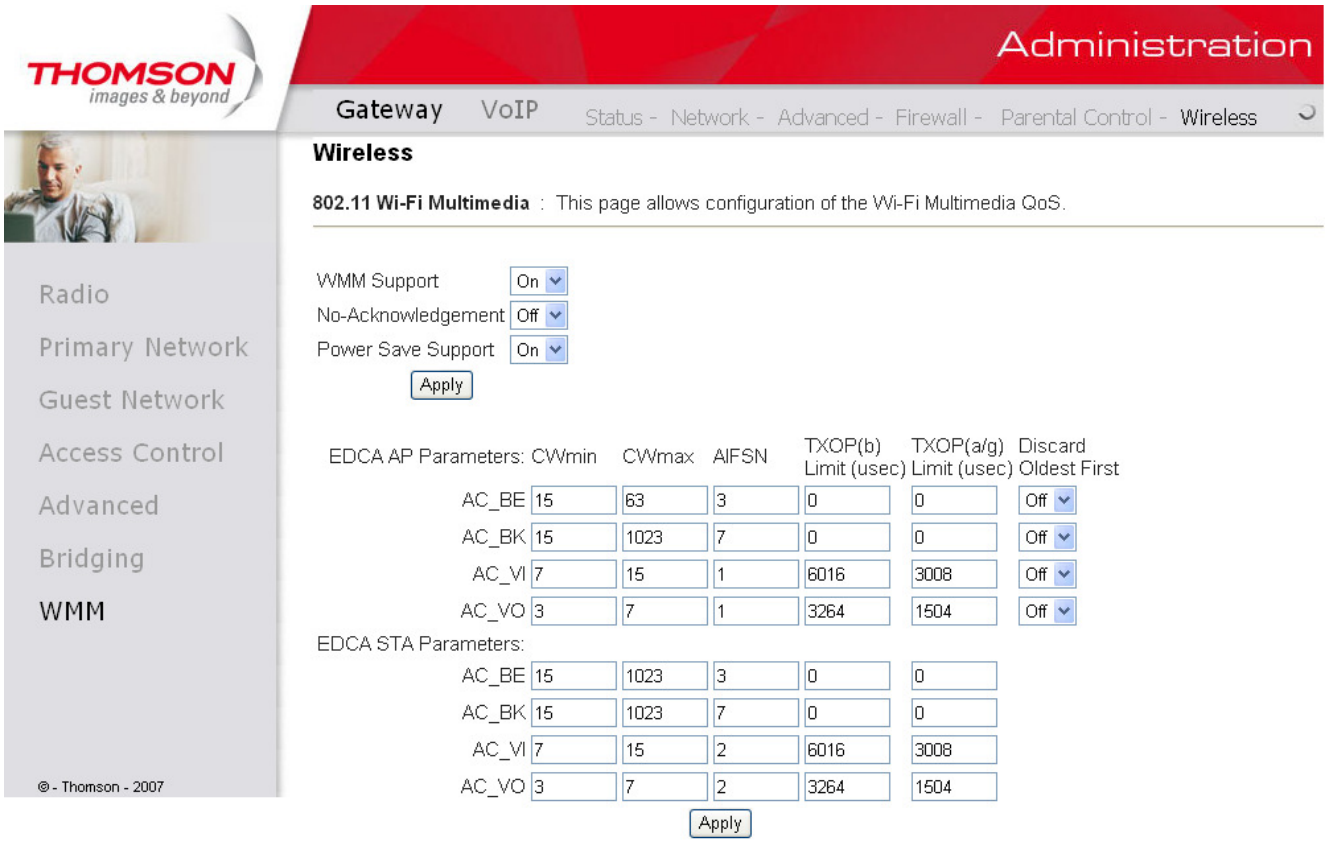
THOMSON
images & beyond
Administration
Gateway
VoIP
Status - Network - Advanced - Firewall - Parental Control - Wireless
Wireless
802.11 Wi-Fi Multimedia : This page allows configuration of the Wi-Fi Multimedia QoS.
Radio
Primary Network
Guest Network
Access Control
Advanced
Bridging
WMM
© - Thomson - 2007
WMM Support On
No-Acknowledgement Off
Power Save Support On
Apply
EDCA AP Parameters: CWmin CWmax AIFSN TXOP(b) Limit (usec) TXOP(a/g) Limit (usec) Discard Oldest First
AC_BE 15 63 3 0 0 Off
AC_BK 15 1023 7 0 0 Off
AC_VI 7 15 1 6016 3008 Off
AC_VO 3 7 1 3264 1504 Off
EDCA STA Parameters:
AC_BE 15 1023 3 0 0
AC_BK 15 1023 7 0 0
AC_VI 7 15 2 6016 3008
AC_VO 3 7 2 3264 1504
Apply

Fig. 56

- **EDCA AP Parameters:**

  The parameters for Access Point (AP) of EDCA (enhanced distributed channel access).
- **EDCA STA Parameters:**

  The parameters for WIFI station of EDCA.

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- **CWmin:** This attribute shall specify the value of the minimum size of the window that shall be used by a QAP for a particular AC for generating a random number for the backoff.
- **CWmax**: This attribute shall specify the value of the maximum size of the window that shall be used by a QAP for a particular AC for generating a random number for the backoff.
- **AIFSN:** This attribute shall specify the number of slots, after a SIFS duration, that the QAP, for a particular AC, shall sense the medium idle either before transmitting or executing a backoff.
- **TXOP (b) Limit (usec)/ TXOP (a/g) Limit (usec):**

  This attribute shall specify the maximum number of microseconds of an EDCA TXOP for a given AC at the QAP.

- **Discard Oldest First**

  If buffer full and parameter is TRUE then discard oldest first.

- **AC's (Access Category) are defined:**

  AC_BK (background)

  AC_BE (best-effort)

  AC_VI (Video)

  AC_VO (Voice)

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Chapter 2: WEB Configuration

VoIP – Basic Web Page Group

1. Basic LAN

This page displays the basic LAN status of this device, including the downstream and upstream status, device information, and interface parameters. You can select specific interface from the Interface Name drop-down menu.

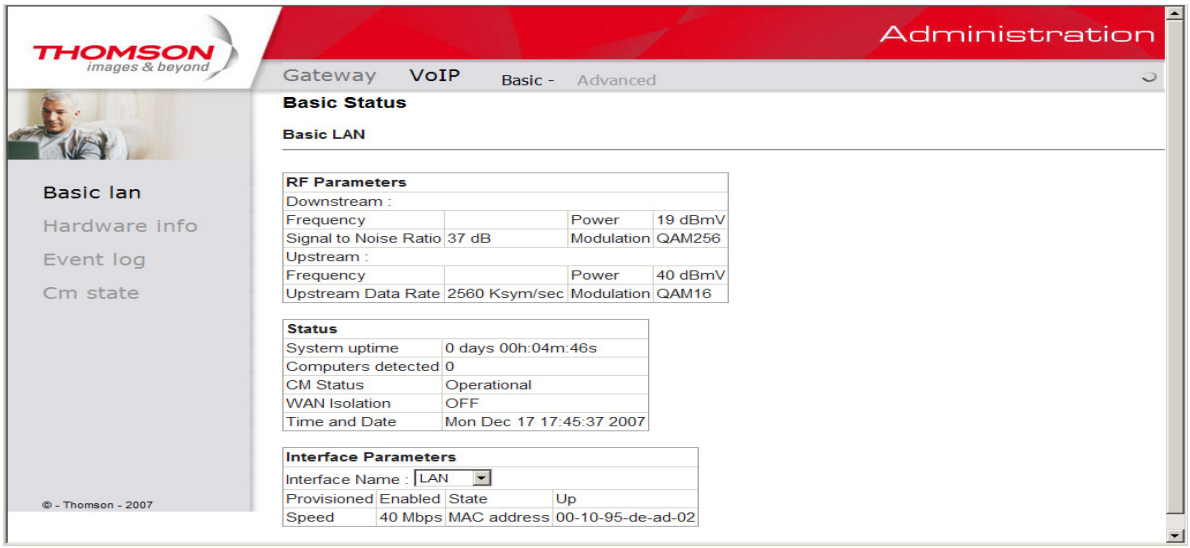

Fig. 57

2. Hardware Info

The hardware Info is displayed on this page.

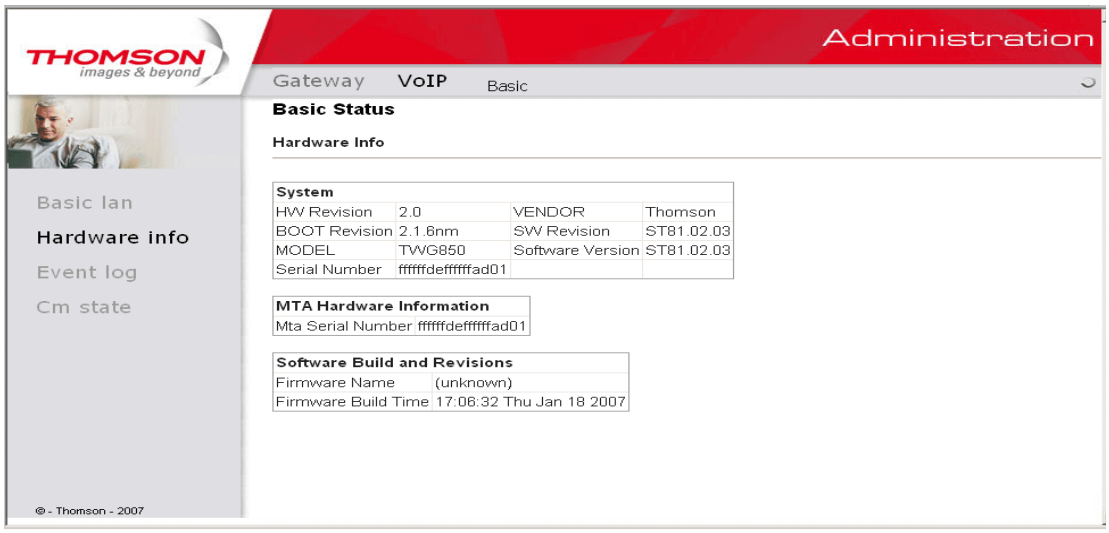

Fig. 58

Illustrations contained in this document are for representation only.

3. Event Log

The event logs are displayed on this web page. You can check them whenever you need.

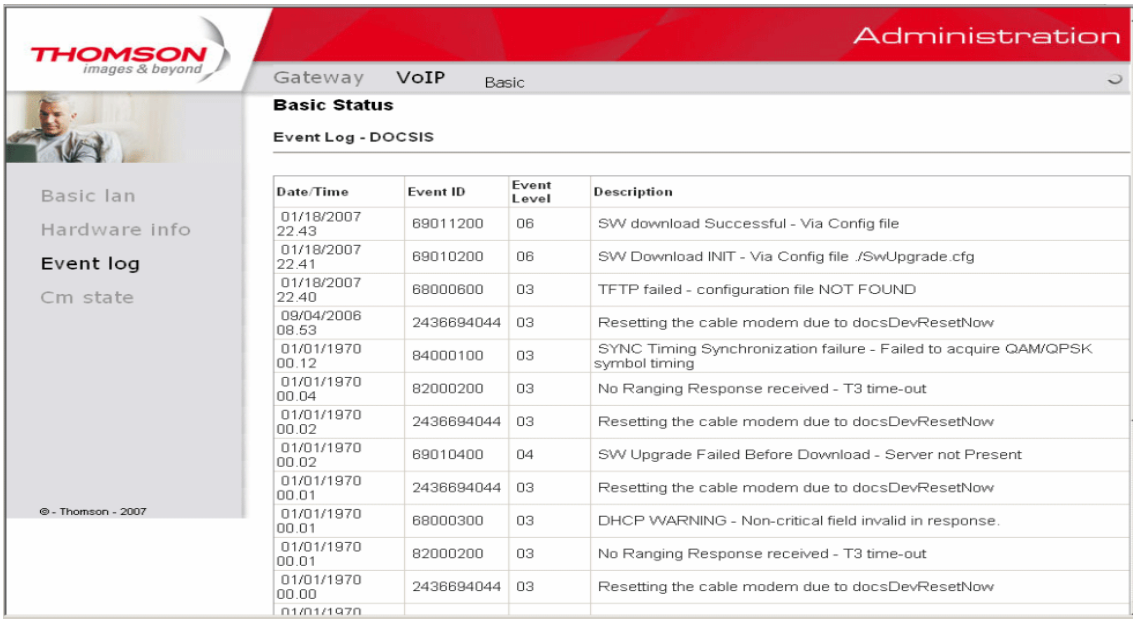

Fig. 59

4. CM State

This page shows the current state of the cable modem.

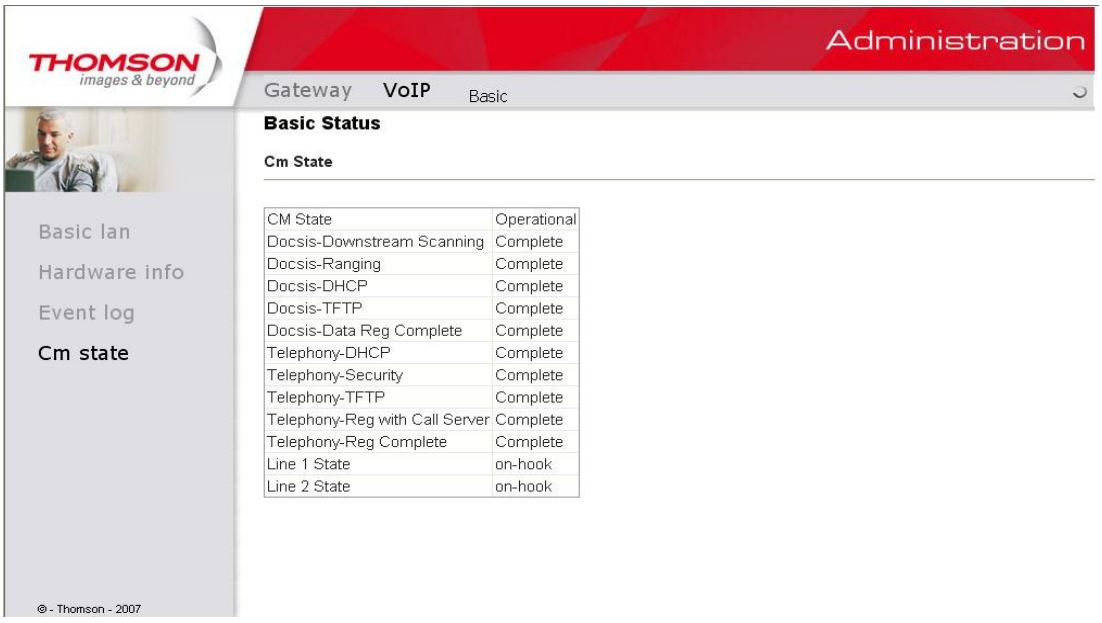

Fig. 60

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Chapter 3: Networking

Communications

Data communication involves the flow of packets of data from one device to another. These devices include personal computers, Ethernet and USB hubs, cable modems, digital routers and switches, and highly integrated devices that combine functions, like the Wireless Cable Gateway.

The gateway integrates the functionality often found in two separate devices into one. It's both a cable modem and an intelligent wireless gateway networking device that can provide a host of networking features, such as NAT and firewall. Figure 2 illustrates this concept, with the cable modem (CM) functionality on the left, and networking functionality on the right. In this figure, the numbered arrows represent communication based on source and destination, as follows:

Type of Communication

1. Communication between the Internet and your PCs
   Example: The packets created by your request for a page stored at a web site, and the contents of that page sent to your PC.

2. Communication between your cable company and the cable modem side
   Example: When your cable modem starts up, it must initialize with the cable company, which requires the cable company to communicate directly with the cable modem itself.

3. Communication between your PCs and the networking side

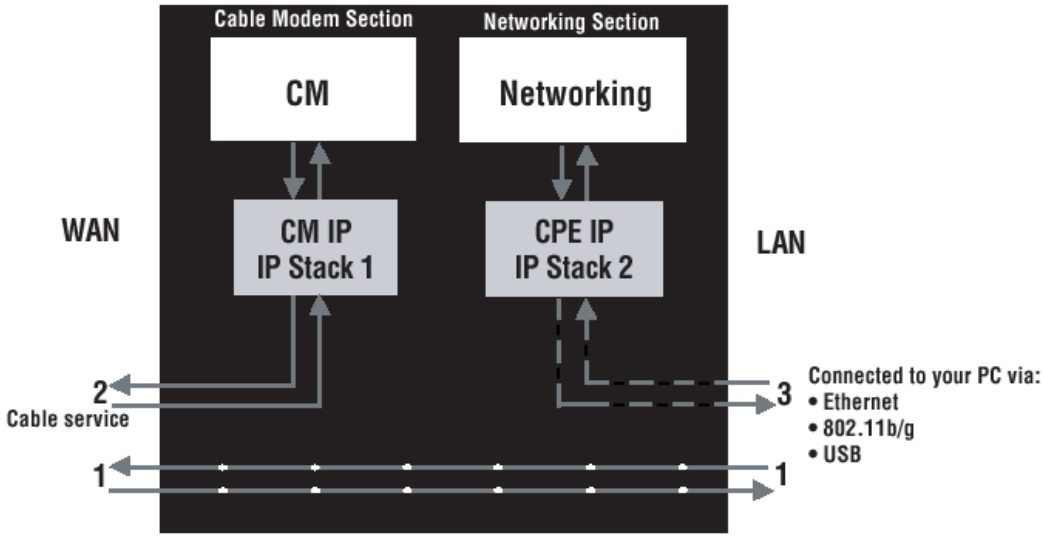

Fig. 61

Example: The Wireless Cable Gateway offers a number of built-in web pages which you can use to configure its networking side; when you communicate with the networking side, your communication is following this path.

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Each packet on the Internet addressed to a PC in your home travels from the Internet down- stream on the cable company's system to the WAN side of your Wireless Cable Gateway. There it enters the Cable Modem section, which inspects the packet, and, based on the results, proceeds to either forward or block the packet from proceeding on to the Networking section. Similarly, the Networking section then decides whether to forward or block the packet from proceeding on to your PC. Communication from your home device to an Internet device works similarly, but in reverse, with the packet traveling upstream on the cable system.

Cable Modem (CM) Section

The cable modem (or CM) section of your gateway uses EURO-DOCSIS Standard cable modem technology. EURO-DOCSIS specifies that TCP/IP over Ethernet style data communication be used between the WAN interface of your cable modem and your cable company.

A EURO-DOCSIS modem, when connected to a Cable System equipped to support such modems, performs a fully automated initialization process that requires no user intervention. Part of this initialization configures the cable modem with a CM IP (Cable Modem Internet Protocol) address, as shown in Figure 3, so the cable company can communicate directly with the CM itself.

Networking Section

The Networking section of your gateway also uses TCP/IP (Transmission Control Protocol/ Internet Protocol) for the PCs you connected on the LAN side. TCP/IP is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

TCP/IP requires that each communicating device be configured with one or more TCP/IP stacks, as illustrated by Figure 4. On a PC, you often use software that came with the PC or its network interface (if you purchased a network interface card separately) to perform this configuration. To communicate with the Internet, the stack must also be assigned an IP (Internet Protocol) address. 192.168.100.1 is an example of an IP address. A TCP/IP stack can be configured to get this IP address by various means, including a DHCP server, by you directly entering it, or sometimes by a PC generating one of its own.

Ethernet requires that each TCP/IP stack on the Wireless Cable Gateway also have associated with it an Ethernet MAC (Media Access Control) address. MAC addresses are permanently fixed into network devices at the time of their manufacture. 00:90:64:12:B1:91 is an example of a MAC address.

Data packets enter and exit a device through one of its network interfaces. The gateway offers Ethernet, USB, and 802.11b/g wireless network interfaces on the LAN side and the EURO-DOCSIS network interface on the WAN side.

When a packet enters a network interface, it is offered to all the TCP/IP stacks associated with the device side from which it entered. But only one stack can accept it — a stack whose configured Ethernet address matches the Ethernet destination address inside the packet. Furthermore, at a packet's final destination, its destination IP address must also match the IP address of the stack.

Each packet that enters a device contains source MAC and IP addresses telling where it came from, and destination MAC and IP addresses telling where it is going to. In addition, the packet contains all or part of a message destined for some application that is running on the destination device. IRC used

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in an Internet instant messaging program, HTTP used by a web browser, and FTP used by a file transfer program are all examples of applications. Inside the packet, these applications are designated by their port number. Port 80, the standard HTTP port, is an example of a port number.

The Networking section of the router performs many elegant functions by recognizing different packet types based upon their contents, such as source and destination MAC address, IP address, and ports.

Three Networking Modes

Your gateway can be configured to provide connectivity between your cable company and your home LAN in any one of three Networking Modes: CM, RG, and CH. This mode setting is under the control of your cable company, who can select the mode to match the level of home networking support for which you have subscribed. All units ship from the factory set for the RG mode, but a configuration file which the cable company sends the cable modem section during its initialization can change it.

Cable Modem (CM) Mode

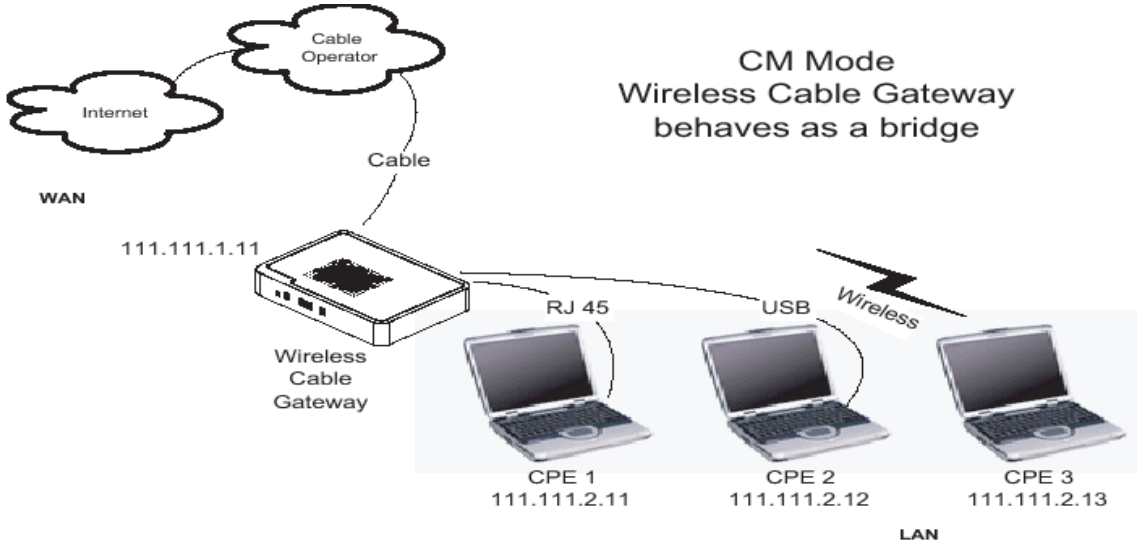

Fig. 62

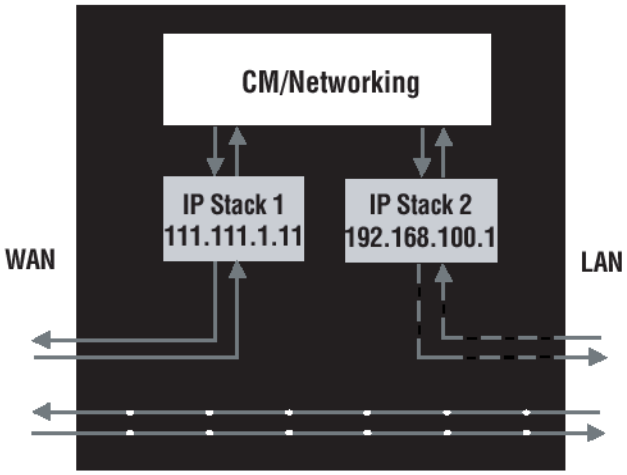

Fig. 63

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CM (Cable Modem) Mode provides basic home networking. In this mode, two IP stacks are active:

- IP Stack 1 - for use by the cable company to communicate with the cable modem section only. This stack receives its IP address from the cable company during CM initialization. It uses the MAC address printed on the label attached to the Wireless Cable gateway.
- IP Stack 2 - for use by you, the end user, to communicate with the cable modem and Networking sections, to access the internal web page diagnostics and con guration. This stack uses a fixed IP address: 192.168.100.1. It uses a MAC address of MAC label + 1 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:92.

With CM Mode, your cable company must provide one IP address for the CM section, plus one for each PC you connect from their pool of available addresses. Your cable company may have you or your installer manually enter these assigned addresses into your PC, or use a DHCP Server to communicate them to your PCs, or use a method that involves you entering host names into your PCs.

Note that in CM Mode, packets passing to the Internet to/from your PCs do not travel through any of the IP stacks; instead they are directly bridged between the WAN and LAN sides.

Residential Gateway (RG) Mode

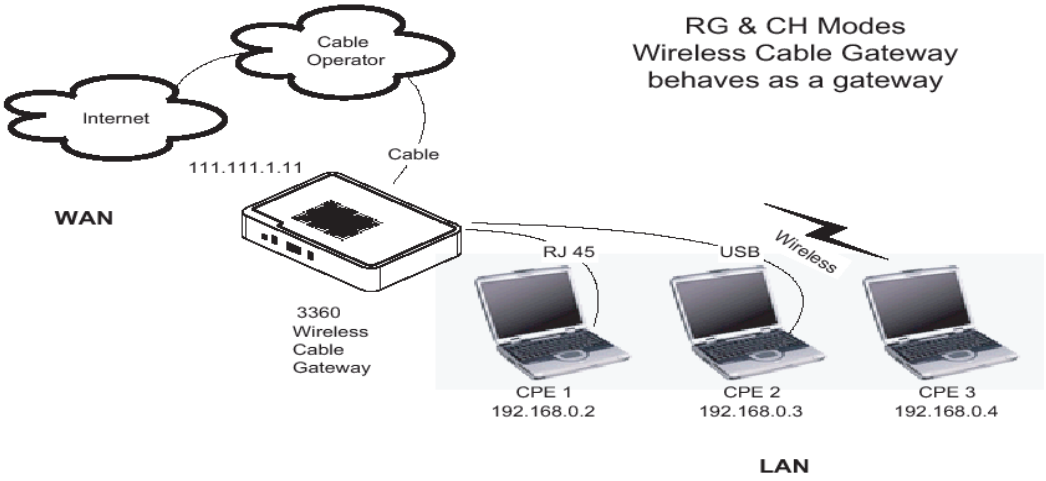

Fig. 64

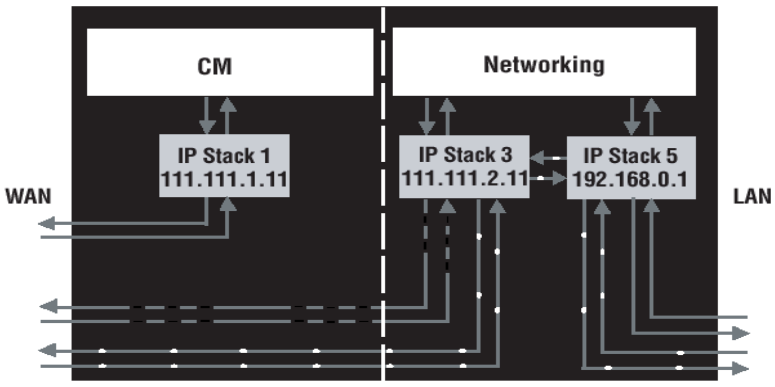

Fig. 65

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Chapter 3: Networking

RG (Residential Gateway) Mode provides basic home networking plus NAT (Network Address Translation). In this mode, three IP stacks are active:

- IP Stack 1 - for use by the cable company to communicate with the Cable Modem section only. This stack receives its IP address from the cable company during CM initialization. It uses the MAC address printed on the label attached to the Wireless Cable Gateway.
- IP Stack 3 - for use by you to remotely (i.e. from somewhere on the WAN side, such as at your remote workplace) communicate with the Cable Modem and Networking sections, to remotely access the internal web page diagnostics and configuration. This stack is also used by your cable company to deliver packets between the Internet and the gateway's networking section so they can be routed to/from your PCs. This stack requires an IP address assigned by the cable company from their pool of available addresses. Your cable company may have you or your installer manually enter assigned addresses into your gateway, or use a DHCP Server to communicate them, or use a method that involves you entering host names. This stack uses a MAC address of MAC label + 2 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:93.
- IP Stack 5 - for use by you to locally (i.e. from somewhere on the LAN side in your home) communicate with the Cable Modem and Networking sections, to access the internal web page diagnostics and configuration. This stack is also used by the gateway's networking section to route packets between the gateway's Networking section and your PCs. This stack uses a fixed IP address: 192.168.0.1. It uses a MAC address of MAC label + 4 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:95.

With RG Mode, your cable company must provide one IP address for the CM section, plus one for the Networking section, from their pool of available addresses. With RG Mode, each PC you connect gets an IP address from a DHCP Server that is part of the Networking section of the gateway.

CableHome (CH) Mode

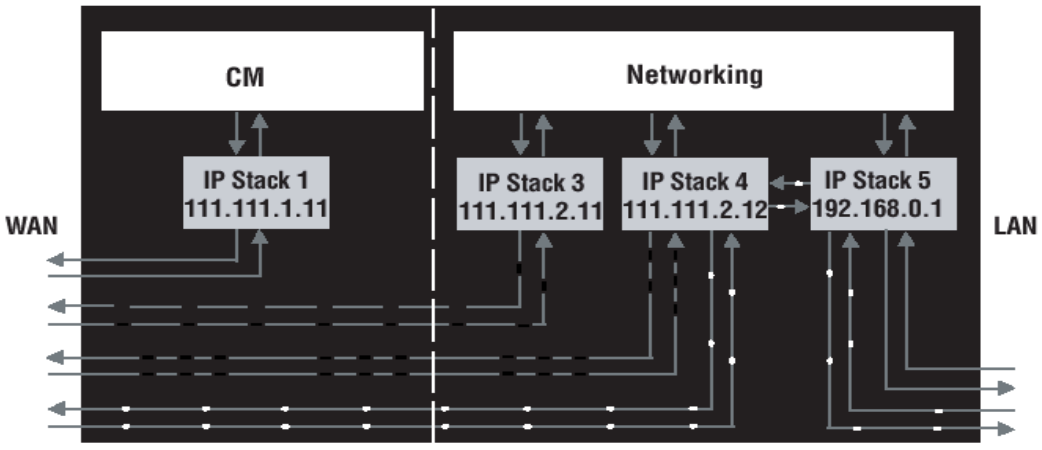

Fig. 66

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CH (CableHome) Mode provides all the functionality of RG mode and adds the ability of the cable company to control the home networking configuration of your Wireless Cable Gateway for you, so you don't need to perform the configuration yourself. In this mode, four IP stacks are active:

- IP Stack 1 - for use by the cable company to communicate with the Cable Modem section only. This stack receives its IP address from the cable company during CM initialization. It uses the MAC address printed on the label attached to the Wireless Cable Gateway.
- IP Stack 3 - for use by your cable company to communicate with the Networking section to help you configure and manage your home networking. This stack requires an IP address assigned by the cable company from their pool of available addresses. Your cable company may have you or your installer manually enter assigned addresses into your gateway, or use a DHCP Server to communicate them, or use a method that involves you entering host names. This stack uses a MAC address of MAC label + 2 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12: B1:93.
- IP Stack 4 - for use by you to remotely (i.e. from somewhere on the WAN side, such as at your remote workplace) communicate with the Cable Modem and Networking sections, to remotely access the internal web page diagnostics and configuration. This stack is also used by your cable company to deliver packets between the Internet and the Wireless Cable Gateway's Networking section so they can be routed to/from your PCs. This stack requires an IP address assigned by the cable company from their pool of available addresses. Your cable company may have you or your installer manually enter these assigned addresses into your gateway, or use a DHCP Server to communicate them, or use a method that involves you entering host names. This stack uses a MAC address of MAC label + 3 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90: 64:12:B1:94.
- IP Stack 5 - for use by you to locally (i.e. from somewhere on the LAN side in your home) communicate with the Cable Modem and Networking sections, to access the internal web page diagnostics and configuration. This stack is also used by the Wireless Cable Gateway Networking section to route packets between the Wireless Cable Gateway's Networking section and your PCs. This stack uses a fixed IP address: 192.168.0.1. It uses a MAC address of MAC label+ 4 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00:90:64:12:B1:95.

With CH Mode, your cable company must provide one IP address for the CM section, plus two for the Networking section, from their pool of available addresses. Each PC you connect gets an IP address from a DHCP Server that is part of the Networking section of the gateway.

USB MAC Address

USB allows a single PC to be connected directly via your Wireless Cable Gateway USB port. Other PCs can, of course, be connected to your other networking interfaces: wireless, HPNA, and Ethernet. If you have a PC connected by USB, the following information is helpful.

The PCs you have connected by 802.11b/g Wireless, and Ethernet technologies associated with your gateway all send and receive packets that contain the Ethernet-style MAC address associated with that network interface. USB technology, however, uses a different addressing approach. In this situation, your gateway modifies the packets going to and from your USB-connected PC to make them look Ethernet-style when passed between you and your cable company. To do this, the gateway must

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effectively “loan” an Ethernet-style address for use in all these packets. For this purpose, the gateway uses a MAC address of MAC label + 5 (the MAC label is found on the bottom of the unit). E.g., if the MAC address is 00:90:64:12:B1:91, this MAC address would be 00: 90:64:12:B1:96.

MAC and IP Addresses Summary

This table summarizes all the MAC and IP addresses that may be associated with the TCP/IP communication stacks and USB handling in your Wireless Cable Gateway. The ones actually used depend upon your gateway Operating Mode, as explained above. At minimum, your cable company will need to know the MAC address associated with IP Stack 1, which is the MAC address shown on the modem label.

Stack Name	Purpose - Mode	MAC Address	IP Address
IP Stack 1 IP Stack 2	CM WAN access - all Modes local management - CM Mode	per label on CM	assigned by cable company during initialization
IP Stack 3 IP Stack 4	only	CM label + 1	fixed at 192.168.100.1
IP Stack 5 ---	CableHome remote management - CH Mode only end-user remote management, LAN WAN access - RG Mode only	CM label + 2 CM label + 3	assigned by cable company assigned by cable company
	WAN data access - CH Mode only	CM label + 4	fixed at 192.168.0.1
	local management - RG, CH Modes only LAN gateway	CM label + 5	

MAC and IP Addresses

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Chapter 4: Additional Information

Frequently Asked Questions

Q. What if I don't subscribe to cable TV?

A. If cable TV is available in your area, data and voice service may be made available with or without cable TV service. Contact your local cable company for complete information on cable services, including high-speed internet access.

Q. How do I get the system installed?

A. Professional installation from your cable provider is strongly recommended. They will ensure proper cable connection to the modem and your computer. However, your retailer may have offered a self installation kit, including the necessary software to communicate with your cable ISP.

Q. Once my Wireless Voice Gateway is connected, how do I get access to the Internet?

A. Your local cable company provides your internet service*, offering a wide range of services including email, chat, and news and information services, and a connection to the World Wide Web.

Q. Can I watch TV, surf the Internet, and talk to my friends through the Wireless Voice Gateway at the same time?

A. Absolutely!

Q. What do you mean by "Broadband?"

A. Simply put, it means you'll be getting information through a "bigger pipe," with more bandwidth, than a standard phone line can offer. A wider, "broader" band means more information, more quickly.

Q. What is Euro-DOCSIS and what does it mean?

A. "Data over Cable Service Interface Specifications" is the industry standard that most cable companies are adopting as they upgrade their systems. Should you ever decide to move, the Wireless Voice Gateway will work with all upgraded cable systems that are Euro-DOCSIS-compliant.

Q. What is Euro-PacketCable and what does it mean?

A. Euro-PacketCable is the industry standard for telephony services that most cable companies are adopting as they upgrade their systems. Should you ever decide to move, the Wireless Voice Gateway will work with all upgraded cable systems that are Euro-PacketCable compliant.

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Chapter 4: Additional Information

Q. What is Xpress Technology and what does it mean?

A. It is one of the popular performance-enhancing WiFi technologies, designed to improve wireless network efficiency and boost throughput. It is more efficient in mixed environments, and it can work with 802.11a/b/g networks. When Xpress is turned on, aggregate throughput (the sum of the individual throughput speeds of each client on the network) can improve by **up to** 27% in 802.11g-only networks, and **up to** 75% in mixed networks comprised of 802.11g and 802.11b standard equipment. The technology achieves higher throughput by by re-packaging data, reducing the number of overhead control packets, so that more useful data can be sent during a given amount of time.

* Monthly subscription fee applies.

** Additional equipment required. Contact your cable company and ISP for any restrictions or additional fees.

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General Troubleshooting

You can correct most problems you have with your product by consulting the troubleshooting list that follows.

I can't access the internet.

- Check all of the connections to your Wireless Voice Gateway.
- Your Ethernet card or USB port may not be working. Check each product's documentation for more information.
- The Network Properties of your operating system may not be installed correctly or the settings may be incorrect. Check with your ISP or cable company.

All of the lights are flashing in sequence.

- This means the Wireless Voice Gateway is automatically updating its system software. Please wait for the lights to stop flashing. The updating process typically lasts less than one minute.
- Do not remove the power supply or reset the Wireless Voice Gateway during this process.

I can't get the modem to establish an Ethernet connection.

- Even new computers don't always have Ethernet capabilities – be sure to verify that your computer has a properly installed Ethernet card and the driver software to support it.
- Check to see that you are using the right type of Ethernet cable.

The modem won't register a cable connection.

- If the modem is in Initialization Mode, the INTERNET light will be flashing. Call your Cable Company if it has not completed this 5-step process within 30 minutes, and note which step it is getting stuck on.
- The modem should work with a standard RG-6 coaxial cable, but if you're using a cable other than the one your Cable Company recommends, or if the terminal connections are loose, it may not work. Check with your Cable Company to determine whether you're using the correct cable.
- If you subscribe to video service over cable, the cable signal may not be reaching the modem. Confirm that good quality cable television pictures are available to the coaxial connector you are using by connecting a television to it. If your cable outlet is "dead", call your Cable Company.

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- Verify that the Cable Modem service is Euro-DOCSIS compliant and Euro-PacketCable compliant by calling your cable provider.

I don't hear a dial tone when I use a telephone.

- Telephone service is not activated. If the rightmost light on the Wireless Voice Gateway stays on while others flash, check with your TSP or cable company.
- If the Wireless Voice Gateway is connected to existing house telephone wiring, make sure that another telephone service is not connected. The other service can normally be disconnected at the Network Interface Device located on the outside of the house.
- If using the second line on a two-line telephone, use a 2-line to 1-line adapter cable.

For more Usage and Troubleshooting Tips use the web site links provided on the CD-ROM:

http://www.cable-modem.rca.com/help

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FCC Declaration of Conformity and Industry Canada Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Trade Name:	Model: TWG850-4
Equipment Classification:	Computing Device Accessory
Responsible Party:	Thomson Inc.
	10330 N. Meridian Street
	Indianapolis, IN 46290
	Telephone 317-415-4151

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect this equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

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Chapter 4: Additional Information

Service Information

If you purchased or leased your Wireless Voice Gateway directly from your cable company, then warranty service for the Digital Cable Modem may be provided through your cable provider or its authorized representative. For information on 1) Ordering Service, 2) Obtaining Customer Support, or 3) Additional Service Information, please contact your cable company. If you purchased your Wireless Voice Gateway from a retailer, see the enclosed warranty card.

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Glossary

10BaseT – Unshielded, twisted pair cable with an RJ-45 connector, used with Ethernet LAN (Local Area Network). "10" indicates speed (10 Mbps), "Base" refers to baseband technology, and "T" means twisted pair cable.

Authentication - The process of verifying the identity of an entity on a network.

DHCP (Dynamic Host Control Protocol) – A protocol which allows a server to dynamically assign IP addresses to workstations on the fly.

Ethernet card – A plug-in circuit board installed in an expansion slot of a personal computer. The Ethernet card (sometimes called a Network Interface Card or NIC) takes parallel data from the computer, converts it to serial data, puts it into a packet format, and sends it over the 10BaseT or 100BaseT LAN cable.

Euro-DOCSIS (Data Over Cable Service Interface Specifications) – A project with the objective of developing a set of necessary specifications and operations support interface specifications for Cable Modems and associated equipment.

F Connector – A type of coaxial connector, labeled CABLE IN on the rear of the Wireless Voice Gateway, that connects the modem to the cable system.

HTTP (HyperText Transfer Protocol) – Invisible to the user, HTTP is used by servers and clients to communicate and display information on a client browser.

Hub – A device used to connect multiple computers to the Wireless Voice Gateway.

IP Address – A unique, 32-bit address assigned to every device in a network. An IP (Internet Protocol) address has two parts: a network address and a host address. This modem receives a new IP address from your cable operator via DHCP each time it goes through Initialization Mode.

Key exchange - The swapping of mathematical values between entities on a network in order to allow encrypted communication between them.

MAC Address – The permanent "identity" for a device programmed into the Media Access Control layer in the network architecture during the modem's manufacture.

Network Driver – A file that is loaded on the computer to allow the computer to recognize the Ethernet card or USB port.

NID - Network Interface Device, the interconnection between the internal house telephone wiring and a conventional telephone service provider's equipment. These wiring connections are normally housed in a

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small plastic box located on an outer wall of the house. It is the legal demarcation between the subscriber's property and the service provider's property.

Euro-PacketCable – A project with the objective of developing a set of necessary telephony specifications and operations support interface specifications for Wireless Voice Gateways and associated equipment used over the Euro-DOCSIS based cable network.

PSTN (Public Switched Telephone Network) – The worldwide voice telephone network which provides dial tone, ringing, full-duplex voice band audio and optional services using standard telephones.

Provisioning - The process of enabling the Media Terminal Adapter (MTA) to register and provide services over the network.

TCP/IP (Transmission Control Protocol/Internet Protocol) – A networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

TFTP - Trivial File Transfer Protocol, the system by which the Media Terminal Adapter's configuration data file is downloaded.

TSP - Telephony Service Provider, an organization that provides telephone services such as dial tone, local service, long distance, billing and records, and maintenance.

Universal Serial Bus (USB) – USB is a "plug-and-play" interface between a computer and add-on devices, such as a Wireless Voice Gateway.

Xpress Technology - One of the popular performance-enhancing WiFi technologies, designed to improve wireless network efficiency and boost throughput. It is more efficient in mixed environments, and it can work with 802.11a/b/g networks.

Please do not send any products to the Indianapolis address listed in this manual or on the carton. This will only add delays in service for your product.

Thomson Inc.

10330 North Meridian Street

Indianapolis, IN 46290

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Fore more information
Thomson | 46, quai Alphonse Le Gallo | 92100 Boulogne-Billancourt | France
Tel. : 33 (0) 1 41 86 50 00 | Fax : 33 (0) 1 41 86 56 59 | www.thomson-broadband.com

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